



FY 2003 Scientific and Technical Reports, Articles, Papers, and Presentations

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B.A. Fowler

Marshall Space Flight Center, Marshall Space Flight Center, Alabama

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FOREWORD

In accordance with the NASA Space Act of 1958, the George C. Marshall Space Flight Center (MSFC) has provided for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof.

Since July 1, 1960, when MSFC was organized, the reporting of scientific and engineering information has been considered a prime responsibility of the Center. Our credo has been that “research and development work is valuable, but only if its results can be communicated and made understandable to others.”

GEORGE C. MARSHALL SPACE FLIGHT CENTER
Marshall Space Flight Center, Alabama

FY 2003 SCIENTIFIC AND TECHNICAL REPORTS,
ARTICLES, PAPERS, AND PRESENTATIONS

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NASA TECHNICAL MEMORANDA

TM—2002—212049

October 2002

The Cryogenic Tensile Properties of an Extruded Aluminum-Beryllium Alloy. W.R. Gamwell. Materials, Processes, and Manufacturing Department, Engineering Directorate.

Basic mechanical properties; i.e., ultimate tensile strength, yield strength, percent elongation, and elastic modulus, were obtained for the aluminum-beryllium alloy, AlBeMet162, at cryogenic (-195.5°C (-320°F) and -252.8°C (-423°F)) temperatures. The material evaluated was purchased to the requirements of SAE-AMS7912, "Aluminum-Beryllium Alloy, Extrusions."

TM—2003—212286

February 2003

An Experimental Investigation To Determine Interaction Between Rotating Bodies (MSFC Center Director's Discretionary Fund Final Report, Project No. 279-00-16). R.N. Grugel, M.P. Volz, and K. Mazuruk.* Microgravity Science and Applications Department, Science Directorate, and *Universities Space Research Association.

A number of recent advanced theories related to torsion properties of the space-time matrix predict the existence of an interaction between classically spinning objects. Indeed, some experimental data suggest that spinning magnetic bodies discernibly interact with Earth's natural fields. If a rotating body modifies the geometry of space-time, then nuclear spins could be used for detection. Thus, assuming a spinning body induces a torsion field, a sensor based on the giant magnetoresistance effect would detect local changes. Experimentally, spinning a brass wheel shielded from Earth's magnetic field showed no measurable change in signals; without shielding, a Faraday disc phenomenon was observed. Unexpected experimental measurements from the nonaxial Faraday disc configuration were recorded, and a theoretical model was derived to explain them.

TM—2003—212343

March 2003

Hybrid Residual Flexibility/Mass-Additive Method for Structural Dynamic Testing. M.L. Tinker. Structures, Mechanics, and Thermal Department, Engineering Directorate.

A large fixture was designed and constructed for modal vibration testing of *International Space Station* elements. This fixed-base test fixture, which weighs thousands of pounds and is anchored to a massive concrete floor, initially utilized spherical bearings and pendulum mechanisms to simulate Shuttle orbiter boundary constraints for launch of the hardware. Many difficulties were encountered during a checkout test of the common module prototype structure, mainly due to undesirable friction and excessive clearances in the test article-to-fixture interface bearings. Measured mode shapes and frequencies were not

representative of orbiter-constrained modes due to the friction and clearance effects in the bearings. As a result, a major redesign effort for the interface mechanisms was undertaken. The total cost of the fixture design, construction and checkout, and redesign was over \$2 million.

Because of the problems experienced with fixed-base testing, alternative free-suspension methods were studied, including the residual flexibility and mass-additive approaches. Free-suspension structural dynamics test methods utilize soft elastic "bungee" cords and overhead frame suspension systems that are less complex and much less expensive than fixed-base systems. The cost of free-suspension fixturing is on the order of tens of thousands of dollars, as opposed to millions, for large fixed-base fixturing. In addition, free-suspension test configurations are portable, allowing modal tests to be done at sites without modal test facilities. For example, a mass-additive modal test of the ASTRO-1 Shuttle payload was done at the Kennedy Space Center launch site. In this Technical Memorandum, the mass-additive and residual flexibility test methods are described in detail. A discussion of a hybrid approach that combines the best characteristics of each method follows and is the focus of the study.

TM—2003—212345

April 2003

Dwell Time and Surface Parameter Effects on Removal of Silicone Oil From D6ac Steel Using TCA. R.E. Boothe. Materials, Processes, and Manufacturing Department, Engineering Directorate.

This study was conducted to evaluate the impact of dwell time, surface roughness, and the surface activation state on 1,1,1-trichloroethane's (TCA's) effectiveness for removing silicone oil from D6ac steel. Silicone-contaminated test articles were washed with TCA solvent, and then the surfaces were analyzed for residue, using Fourier transform infrared spectroscopy. The predominant factor affecting the ability to remove the silicone oil was surface roughness.

TM—2003—212500

June 2003

Performance Testing of Thermal Interface Filler Materials in a Bolted Aluminum Interface Under Thermal/Vacuum Conditions. S.D. Glasgow and K.B. Kittredge. Structures, Mechanics, and Thermal Department, Engineering Directorate.

A thermal interface material is one of the many tools often used as part of the thermal control scheme for space-based applications. Historically, at Marshall Space Flight Center, CHO-THERM 1671 has primarily been used for applications where an interface material was deemed necessary. However, numerous alternatives have come on the market in recent years. It was decided that a number of these materials should be tested against each other to see if there were better performing alternatives. The tests were done strictly to compare the

NASA TECHNICAL MEMORANDA

thermal performance of the materials relative to each other under repeatable conditions and do not take into consideration other design issues, such as off-gassing, electrical conduction, isolation, etc. The purpose of this Technical Memorandum is to detail the materials tested, test apparatus, procedures, and results of these tests. The results show that there are a number of better performing alternatives now available.

TM—2003–212501

June 2003

Field Programmable Gate Array for Implementation of Redundant Advanced Digital Feedback Control. K.D. King. Materials, Processes, and Manufacturing Department, Engineering Directorate.

The goal of this effort was to develop a digital motor controller using field programmable gate arrays (FPGAs). This is a more rugged approach than a conventional microprocessor digital controller. FPGAs typically have higher radiation tolerance than both the microprocessor and memory required for a conventional digital controller. Furthermore, FPGAs can typically operate at higher speeds. (While speed is usually not an issue for motor controllers, it can be for other system controllers.) Other than motor power, only a 3.3-V digital power supply was used in the controller; no analog bias supplies were used. Since most of the circuit was implemented in the FPGA, no additional parts were needed other than the power transistors to drive the motor. The benefits that FPGAs provide over conventional designs—lower power and fewer parts—allow for smaller packaging and reduced weight and cost.

TM—2003–212502

June 2003

Advanced Health Management of a Brushless Direct Current Motor/Controller. R.D. Pickett. Avionics Department, Engineering Directorate.

This effort demonstrates that health management can be taken to the component level for electromechanical systems. The same techniques can be applied to take any health management system to the component level, based on the practicality of the implementation for that particular system. This effort allows various logic schemes to be implemented for the identification and management of failures. By taking health management to the component level, integrated vehicle health management systems can be enhanced by protecting box-level avionics from being shut down in order to isolate a failed computer.

TM—2003–212503

June 2003

Infrared Database for Process Support Materials. K.E. Bennett, R.E. Boothe, and H.D. Burns. Materials, Processes, and Manufacturing Department, Engineering Directorate.

In order to help identify contamination found on bonding surfaces, optical surfaces, or other items, the Materials

Contamination Team of the Materials, Processes, and Manufacturing Department at Marshall Space Flight Center (MSFC) has initiated the development of an infrared database containing MSFC process materials and residues. Process materials analyzed to date using infrared spectroscopy for transferable and extractable contamination have included gloves, wiper cloths, solvents, bagging materials, etc. Significant findings included silicone contamination on several gloves and observations of extractables from the majority of materials tested.

TM—2003–212633

July 2003

Determination of Significant Composite Processing Factors by Designed Experiment (MSFC Center Director's Discretionary Fund Final Report, Project No. 95–23). J.L. Finckenor. Structures, Mechanics, and Thermal Department, Engineering Directorate.

To determine composite material properties' effects from processing variables, a 3 factorial designed experiment with two replicates was conducted. The factors were cure method (oven versus autoclave), layup (hand versus tape-laying machine), and thickness (8 versus 52 ply). Four material systems were tested: AS4/3501–6, IM7/8551–7, IM7/F655 bismaleimide (BMI), and shear tests on IM7/F584. Material properties were G_{12} , ν_{12} , E_{1C} , and E_{2C} . Since the samples were necessarily nonstandard, strengths, though recorded, cannot be considered valid. Void content was also compared.

Autoclave curing helped material properties for the low modulus fiber material but showed little benefit for higher stiffness fibers. The number of plies was very important for epoxy composites but not for the BMI. E_1 was generally unaffected by any factor.

Particularly high void content did correlate to reduced properties. Autoclave curing reduced void content over oven curing but a moderate amount of voids, <1 percent void content, did not correlate with material properties.

Oven cures and hand layups can produce high-quality parts. Part thickness of epoxy composites is important, though cure optimization may improve performance. Significant variations can be caused by processing and it is important that test coupons always reflect the layup and processes of the final part.

TM—2003–212635

July 2003

Science Directorate Publications and Presentations, January 1–December 31, 2002. Compiled by F.G. Summers. Science Directorate.

This Technical Memorandum lists the significant publications and presentations of the Science Directorate during the period January 1–December 31, 2002. Entries in the main part of the document are categorized according to NASA Reports (arranged by report number), Open Literature, and Presentations (arranged alphabetically by title). Most of the articles listed under Open Literature have appeared in refereed professional

journals, books, monographs, or conference proceedings. Although many published abstracts are eventually expanded into full papers for publication in scientific and technical journals, they are often sufficiently comprehensive to include the significant results of the research reported. Therefore, published abstracts are listed separately in a subsection under Open Literature. Questions or requests for additional information about the entries in the report should be directed to Dr. A.F. Whitaker (SD01, 256-544-2481) or one of the authors.

TM—2003-212636 July 2003
Microgravity Manufacturing Via Fused Deposition. K.G. Cooper and M.R. Griffin. Materials, Processes, and Manufacturing Department, Engineering Directorate.

Manufacturing polymer hardware during space flight is currently outside the state of the art. A process called fused deposition modeling (FDM) can make this approach a reality by producing net-shaped components of polymer materials directly from a CAE model. FDM is a rapid prototyping process developed by Stratasys, Inc., which deposits a fine line of semimolten polymer onto a substrate while moving via computer control to form the cross-sectional shape of the part it is building. The build platen is then lowered and the process is repeated, building a component directly layer by layer. This method enables direct net-shaped production of polymer components directly from a computer file. The layered manufacturing process allows for the manufacture of complex shapes and internal cavities otherwise impossible to machine. This task demonstrated the benefits of the FDM technique to quickly and inexpensively produce replacement components or repair broken hardware in a Space Shuttle or Space Station environment.

The intent of the task was to develop and fabricate an FDM system that was lightweight, compact, and required minimum power consumption to fabricate ABS plastic hardware in microgravity. The final product of the shortened task turned out to be a ground-based breadboard device, demonstrating miniaturization capability of the system.

TM—2003-212690 August 2003
Development of Enhanced Avionics Flight Hardware Selection Process. K. Smith and G.L. Watson. Avionics Department, Engineering Directorate.

The primary objective of this research was to determine the processes and feasibility of using commercial off-the-shelf PC104 hardware for flight applications. This would lead to a faster, better, and cheaper approach to low-budget programs as opposed to the design, procurement, and fabrication of space flight hardware. This effort will provide experimental evaluation with results of flight environmental testing. Also, a method and/or suggestion used to bring test hardware up to flight standards will be given. Several microgravity programs, such as the Equiaxed Dendritic Solidification Experiment, Self-Diffusion in Liquid Elements, and various other programs, are interested in PC104 environmental testing to establish the limits of this technology.

TM—2003-212692 August 2003
Correlation of Radiation Dosage With Mechanical Properties of Thin Films. R.L. Newton. Materials, Processes, and Manufacturing Department, Engineering Directorate.

The objective of this investigation was to examine the relationship between irradiation level (proton dose), microstructure, and stress levels in chemical vapor-deposited diamond and polysilicon films using cross-sectioned specimens. However, the emphasis was placed on the diamond specimen because diamond holds much promise for use in advanced technologies. The use of protons allows not only the study of the charged particle that may cause the most microstructural damage in Earth-orbit microelectromechanical systems (MEMS) devices, but also allows the study of relatively deeply buried damage inside the diamond material. Using protons allows these studies without having to resort to megaelectronvolt implant energies that may create extensive damage due to the high energy that is needed for the implantation process. Since MEMS devices operating in space will not have an opportunity to reverse radiation damage via annealing, only nonannealed specimens were investigated. The following three high spatial resolution techniques were used to examine these relationships: (1) Scanning electron microscopy, (2) micro-Raman spectroscopy, and (3) micro x-ray diffraction.

TP—2002–212020/REV1

December 2002

Statistical Properties of Maximum Likelihood Estimators of Power Law Spectra Information. L.W. Howell. Space Science Department, Science Directorate.

A simple power law model consisting of a single spectral index, α_1 , is believed to be an adequate description of the galactic cosmic-ray (GCR) proton flux at energies below 10^{13} eV, with a transition at the knee energy, E_k , to a steeper spectral index $\alpha_2 > \alpha_1$ above E_k . The maximum likelihood (ML) procedure was developed for estimating the single parameter α_1 of a simple power law energy spectrum and generalized to estimate the three spectral parameters of the broken power law energy spectrum from simulated detector responses and real cosmic-ray data. The statistical properties of the ML estimator were investigated and shown to have the three desirable properties: (P1) consistency (asymptotically unbiased), (P2) efficiency (asymptotically attains the Cramer-Rao minimum variance bound), and (P3) asymptotically normally distributed, under a wide range of potential detector response functions. Attainment of these properties necessarily implies that the ML estimation procedure provides the best unbiased estimator possible.

While simulation studies can easily determine if a given estimation procedure provides an unbiased estimate of the spectra information, and whether or not the estimator is approximately normally distributed, attainment of the Cramer-Rao bound (CRB) can only be ascertained by calculating the CRB for an assumed energy spectrum-detector response function combination, which can be quite formidable in practice. However, the effort in calculating the CRB is very worthwhile because it provides the necessary means to compare the efficiency of competing estimation techniques and, furthermore, provides a stopping rule in the search for the best unbiased estimator. Consequently, the CRB for both the simple and broken power law energy spectra are derived herein and the conditions under which they are attained in practice are investigated.

The ML technique is then extended to estimate spectra information from an arbitrary number of astrophysics data sets produced by vastly different science instruments. This theory and its successful implementation will facilitate the interpretation of spectral information from multiple astrophysics missions and thereby permit the derivation of superior spectral parameter estimates based on the combination of data sets.

TP—2002–212076

November 2002

Test and Analysis Capabilities of the Space Environment Effects Team at Marshall Space Flight Center. M.M. Finckenor, D.L. Edwards, J.A. Vaughn, T.A. Schneider, M.A. Hovater, and D.T. Hoppe. Materials, Processes, and Manufacturing Department, Engineering Directorate.

Marshall Space Flight Center has developed world-class space environmental effects testing facilities to simulate the

space environment. The combined environmental effects test system exposes temperature-controlled samples to simultaneous protons, high- and low-energy electrons, vacuum ultraviolet (VUV) radiation, and near-ultraviolet (NUV) radiation. Separate chambers for studying the effects of NUV and VUV at elevated temperatures are also available. The Atomic Oxygen Beam Facility exposes samples to atomic oxygen of 5 eV energy to simulate low-Earth orbit (LEO). The LEO space plasma simulators are used to study current collection to biased spacecraft surfaces, arcing from insulators and electrical conductivity of materials. Plasma propulsion techniques are analyzed using the Marshall magnetic mirror system. The micro light gas gun simulates micrometeoroid and space debris impacts.

Candidate materials and hardware for spacecraft can be evaluated for durability in the space environment with a variety of analytical techniques. Mass, solar absorptance, infrared emittance, transmission, reflectance, bidirectional reflectance distribution function, and surface morphology characterization can be performed. The data from the space environmental effects testing facilities, combined with analytical results from flight experiments, enable the Environmental Effects Group to determine optimum materials for use on spacecraft.

TP—2003–212257

February 2003

Statistical Evaluation and Improvement of Methods for Combining Random and Harmonic Loads. A.M. Brown and D.S. McGhee. Structural, Mechanics, and Thermal Department, Engineering Directorate.

Structures in many environments experience both random and harmonic excitation. A variety of closed-form techniques has been used in the aerospace industry to combine the loads resulting from the two sources. The resulting combined loads are then used to design for both yield/ultimate strength and high-cycle fatigue capability. This Technical Publication examines the cumulative distribution percentiles obtained using each method by integrating the joint probability density function of the sine and random components. A new Microsoft Excel spreadsheet macro that links with the software program Mathematica to calculate the combined value corresponding to any desired percentile is then presented along with a curve fit to this value. Another Excel macro that calculates the combination using Monte Carlo simulation is shown. Unlike the traditional techniques, these methods quantify the calculated load value with a consistent percentile. Using either of the presented methods can be extremely valuable in probabilistic design, which requires a statistical characterization of the loading. Additionally, since the cumulative distribution function at high probability levels is very flat, the design value is extremely sensitive to the predetermined percentile; therefore, applying the new techniques can substantially lower the design loading without losing any of the identified structural reliability.

TP—2003–212284

February 2003

Pulse Detonation Rocket Magnetohydrodynamic Power Experiment. R.J. Litchford, J.E. Jones, C.C. Dobson, J.W. Cole, B.R. Thompson,* D.H. Plemmons,** and M.W. Turner.*** Advanced Space Transportation Program Office, Space Transportation Directorate, *TMET, **Plemmons Consulting, and ***The University of Alabama in Huntsville.

The production of onboard electrical power by pulse detonation engines is problematic in that they generate no shaft power; however, pulse detonation-driven magnetohydrodynamic (MHD) electrical power generation represents one intriguing possibility for attaining self-sustained engine operation and generating large quantities of burst power for onboard electrical systems. To examine this possibility further, a simple heat-sink apparatus was developed for experimentally investigating pulse detonation-driven MHD generator concepts. The hydrogen-oxygen-fired driver was a 90-cm-long stainless steel tube having a 4.5-cm-square internal cross section and a short Schelkin spiral near the head-end to promote rapid formation of a detonation wave. The tube was intermittently filled to atmospheric pressure and seeded with a CsOH/methanol spray prior to ignition by electrical spark. The driver exhausted through an aluminum nozzle having an area contraction ratio of $A^*/A_c=1/10$ and an area expansion ratio of $A_e/A^*=3.2$ (as limited by available magnet bore size). The nozzle exhausted through a 24-electrode segmented Faraday channel (30.5-cm active length), which was inserted into a 0.6-T permanent magnet assembly. Initial experiments verified proper drive operation with and without the nozzle attachment, and head-end pressure and time-resolved thrust measurements were acquired. The exhaust jet from the nozzle was interrogated using a polychromatic microwave interferometer yielding an electron number density on the order of 10^{12} cm^{-3} at the generator entrance. In this case, MHD power generation experiments suffered from severe near-electrode voltage drops and low MHD interaction; i.e., low flow velocity, due to an inherent physical constraint on expansion with the available magnet. Increased scaling, improved seeding techniques, higher magnetic fields, and higher expansion ratios are expected to greatly improve performance.

TP—2003–212285

February 2003

Magnetohydrodynamic Augmented Propulsion Experiment: I. Performance Analysis and Design. R.J. Litchford, J.W. Cole, J.T. Lineberry,* J.N. Chapman,* H.J. Schmidt,* and C.W. Lineberry.* Advanced Space Transportation Program Office, Space Transportation Directorate, and *LyTec LLC.

The performance of conventional thermal propulsion systems is fundamentally constrained by the specific energy limitations associated with chemical fuels and the thermal limits

of available materials. Electromagnetic thrust augmentation represents one intriguing possibility for improving the fuel consumption of thermal propulsion systems, thereby increasing overall specific energy characteristics; however, realization of such a system requires an extremely high-energy-density electrical power source as well as an efficient plasma acceleration device. This Technical Publication describes the development of an experimental research facility for investigating the use of cross-field magnetohydrodynamic (MHD) accelerators as a possible thrust augmentation device for thermal propulsion systems. In this experiment, a 1.5-MW_e Aerotherm arc heater is used to drive a 2-MW_e MHD accelerator. The heat-sink MHD accelerator is configured as an externally diagonalized, segmented channel, which is inserted into a large-bore, 2-T electromagnet. The performance analysis and engineering design of the flow path are described as well as the parameter measurements and flow diagnostics planned for the initial series of test runs.

TP—2003–212340

March 2003

Using Plate Finite Elements for Modeling Fillets in Design, Optimization, and Dynamic Analysis. A.M. Brown and R.M. Seugling.* Structures, Mechanics, and Thermal Department, Engineering Directorate, and *The University of North Carolina at Charlotte.

Fillets are one of the most common design features in structures. Proper finite element modeling of these fillets can frequently be problematic though. If the ratio of the fillet radius to the wall thickness is relatively large, the fillet cannot be ignored because it contributes significantly to structural stiffness, and although the most appropriate element for modeling the structure in general may be the plate element, geometric representation of the fillets requires the use of solid elements. This problem is the motivation for the development of a method that uses “bridge” plate elements connecting the tangent points of the fillet to accurately represent its stiffness and mass. The methodology equates the rotational deflection at the tangent point, derived from the proposed bridge system, with an analytical solution of the fillet itself to generate a pseudo Young’s Modulus and thickness for use in the bridge plates. The method was tested on a typical filleted structure, with the bridge method yielding modal analysis results as accurate as a high-fidelity solid model when compared to modal test but with a 90-percent reduction in number of degrees of freedom. This capability could prove extremely useful in design, dynamic, deflection, and preliminary stress analysis, and optimization.

TP—2003–212341

March 2003

Magnetic Flux Compression Experiments Using Plasma Armatures. M.W. Turner,* C.W. Hawk,* and R.J. Litchford. Advanced Space Transportation Program Office, Space Transportation Directorate, and *The University of Alabama in Huntsville.

Magnetic flux compression reaction chambers offer considerable promise for controlling the plasma flow associated with various micronuclear/chemical pulse propulsion and power schemes, primarily because they avoid thermalization with wall structures and permit multicycle operation modes. The major physical effects of concern are the diffusion of magnetic flux into the rapidly expanding plasma cloud and the development of Rayleigh-Taylor instabilities at the plasma surface, both of which can severely degrade reactor efficiency and lead to plasma-wall impact. A physical parameter of critical importance to these underlying magnetohydrodynamic (MHD) processes is the magnetic Reynolds number (R_m), the value of which depends upon the product of plasma electrical conductivity and velocity. Efficient flux compression requires $R_m \gg 1$, and a thorough understanding of MHD phenomena at high magnetic Reynolds numbers is essential to the reliable design and operation of practical reactors. As a means of improving this understanding, a simplified laboratory experiment has been constructed in which the plasma jet ejected from an ablative pulse plasma gun is used to investigate plasma armature interaction with magnetic fields. As a prelude to intensive study, exploratory experiments were carried out to quantify the magnetic Reynolds number characteristics of the plasma jet source. Jet velocity was deduced from time-of-flight measurements using optical probes, and electrical conductivity was measured using an inductive probing technique. Using air at 27-inHg vacuum, measured velocities approached 4.5 km/s and measured conductivities were in the range of 30 to 40 kS/m.

TP—2003–212342

March 2003

Flightweight Carbon Nanotube Magnet Technology. J.N. Chapman,* H.J. Schmidt,* R.S. Ruoff,** V. Chandrasekhar,** D.A. Dikin,** and R.J. Litchford. Advanced Space Transportation Program Office, Space Transportation Directorate, *LyTec LLC, and **Northwestern University.

Virtually all plasma-based systems for advanced airborne/spaceborne propulsion and power depend upon the future availability of flightweight magnet technology. Unfortunately, current technology for resistive and superconducting magnets yields system weights that tend to counteract the performance advantages normally associated with advanced plasma-based concepts. The ongoing nanotechnology revolution and the continuing development of carbon nanotubes (CNT), however, may ultimately relieve this limitation in the near future. Projections based on recent research indicate that CNTs may achieve current densities at least three orders of magnitude larger than known superconductors and mechanical strength two orders

of magnitude larger than steel. In fact, some published work suggests that CNTs are superconductors. Such attributes imply a dramatic increase in magnet performance-to-weight ratio and offer real hope for the construction of true flightweight magnets. This Technical Publication reviews the technology status of CNTs with respect to potential magnet applications and discusses potential techniques for using CNT wires and ropes as a winding material and as an integral component of the containment structure. The technology shortfalls are identified and a research and technology strategy is described that addresses the following major issues: (1) Investigation and verification of mechanical and electrical properties, (2) development of tools for manipulation and fabrication on the nanoscale, (3) continuum/molecular dynamics analysis of nanotube behavior when exposed to practical bending and twisting loads, and (4) exploration of innovative magnet fabrication techniques that exploit the natural attributes of CNTs.

TP—2003–212634

July 2003

Capabilities of the Materials Contamination Team at Marshall Space Flight Center. H.D. Burns, M.M. Finckenor, R.E. Boothe, K.C. Albyn, and C.A. Finchum. Materials, Processes, and Manufacturing Department, Engineering Directorate.

The Materials Contamination Team of the Environmental Effects Group, Materials, Processes, and Manufacturing Department, has been recognized for its contribution to space flight, including space transportation, space science, and flight projects, such as the reusable solid rocket motor, Chandra X-Ray Observatory, and the *International Space Station*. The Materials Contamination Team's realm of responsibility encompasses all phases of hardware development including design, manufacturing, assembly, test, transportation, launch-site processing, on-orbit exposure, return, and refurbishment, if required. Contamination is a concern in the Space Shuttle with sensitive bondlines and reactive fluid (liquid oxygen) compatibility as well as for sensitive optics, particularly spacecraft, such as the Hubble Space Telescope and Chandra X-Ray Observatory.

The Materials Contamination Team has a variety of facilities and instrumentation capable of contaminant detection, identification, and monitoring. The team addresses material applications dealing with environments, including production facilities, clean rooms, and on-orbit exposure. The team of engineers and technicians also develops and evaluates new surface cleanliness inspection technologies. Databases are maintained by the team for process materials as well as outgassing and optical compatibility test results for specific environments.

NASA CONFERENCE PUBLICATIONS

CP—2003–212339

February 2003

2002 Microgravity Materials Science Conference. D. Gillies, N. Ramachandran,* K. Murphy,** D. McCauley,*** and N. Bennett,* Editors. Microgravity Science and Applications Department, Science Directorate, *Universities Space Research Association, **Morgan Research Corporation, and ***The University of Alabama in Huntsville.

The 2002 Microgravity Materials Science Conference was held June 25–26, 2002, at the Von Braun Center, Huntsville, Alabama. Organized by the Microgravity Materials Science Discipline Working Group, sponsored by the Physical Sciences Research Division, NASA Headquarters, and hosted by NASA Marshall Space Flight Center and member institutions under the COoperative Research in Biology and Materials Science (CORBAMS) agreement, the conference provided a forum to review the current research and activities in materials science, discuss the envisioned long-term goals, highlight new crosscutting research areas of particular interest to the Physical Sciences Research Division, and inform the materials science community of research opportunities in reduced gravity. An abstracts book was published and distributed at the conference

to the approximately 240 people attending, who represented industry, academia, and other NASA Centers. The proceedings on this CD-ROM are comprised of the research reports submitted by the Principal Investigators in the Microgravity Materials Science program.

CP—2003–212344

April 2003

The 2002 NASA Aerospace Battery Workshop. J.C. Brewer, Compiler. Avionics Department, Engineering Directorate.

This document contains the proceedings of the 35th annual NASA Aerospace Battery Workshop, hosted by the Marshall Space Flight Center, November 19–21, 2002. The workshop was attended by scientists and engineers from various agencies of the U.S. Government, aerospace contractors, and battery manufacturers, as well as international participation in like kind.

The subjects covered included nickel-hydrogen, lithium-ion, nickel-metal hydride, lithium-sulfur, lithium-iron disulfide, and silver-zinc technologies.

NASA CONTRACTOR REPORTS

CR—2002–212050

October 2002

Integrated In-Space Transportation Plan. B. Farris, B. Eberle, G. Woodcock, and B. Negast. Advanced Space Transportation Program Office, Space Transportation Directorate, and Gray Research, Inc.

The purpose of this report is to provide the reader with a readily accessible reference volume and history for the Integrated In-Space Transportation Plan (IISTP) phase I effort. This report was prepared by Gray Research, Inc., as a partial fulfillment of the Integrated Technology Assessment Center subcontract No. 4400037135 in support of the IISTP phase I effort within the In-Space Investment Area of the Advanced Space Transportation Program managed at Marshall Space Flight Center, Huntsville, Alabama. Much of the data used in the preparation of this report was taken from analyses, briefings, and reports prepared by the vast number of dedicated engineers and scientists who participated in the IISTP phase I effort. The opinions and ideas expressed in this report are solely those of the authors and do not necessarily reflect those of NASA in whole or in part.

CR—2003–212397

April 2003

The 2002 NASA Faculty Fellowship Program Research Reports. S.K. Nash-Stevenson, C.L. Karr,* L.M. Freeman,* and G. Karr** (Program Co-Directors), and J. Bland (Compiler and Editor). Education Programs Department, Customer and Employee Relations Directorate, *The University of Alabama, and **The University of Alabama in Huntsville.

For the 38th consecutive year, a NASA Faculty Fellowship Program was conducted at Marshall Space Flight Center (MSFC). The program was conducted by The University of Alabama and MSFC May 28–August 2, 2002. Operated under the auspices of the American Society for Engineering Education, the MSFC program, as well as those at other NASA Centers, was sponsored by the University Affairs Office, NASA Headquarters, Washington, DC. The basic objectives of the program, which is in its 38th year of operation nationally, are to: (1) Further the professional knowledge of qualified engineering and science faculty members, (2) stimulate an exchange of ideas between participants and NASA, (3) enrich and refresh the research and teaching activities of the participants' institutions, and (4) contribute to the research objectives of the NASA Centers. The Faculty Fellows spent 10 weeks at MSFC engaged in a research project compatible with their interests and background and worked in collaboration with a NASA MSFC colleague. This CD is a compilation of Fellows' reports on their research during the summer of 2002.

CR—2003–212504

June 2003

Modeling Charge Collection in Detector Arrays. J.C. Pickel. NASA's Space Environments and Effects Program and PR&T, Inc.

A detector array charge collection model has been developed for use as an engineering tool to aid in the design of optical sensor missions for operation in the space radiation environment. This model is an enhancement of the prototype array charge collection model that was developed for the NGST program. The primary enhancements were accounting for drift-assisted diffusion by Monte Carlo modeling techniques and implementing the modeling approaches in a windows-based code. The modeling is concerned with integrated charge collection within discrete pixels in the focal plane array (FPA), with high-fidelity spatial resolution. It is applicable to all detector geometries, including monolithic charged-coupled devices (CCDs), active pixel sensors (APS), and hybrid FPA geometries based on a detector array bump-bonded to a readout integrated circuit (ROIC).

CR—2003–212637

August 2003

Electrostatic Return of Contaminants. R. Rantanen and T. Gordon.* NASA's Space Environments and Effects Program, ROR Enterprises, and *Applied Science Technologies.

A model has been developed capable of calculating the electrostatic return of spacecraft-emitted molecules that are ionized and attracted back to the spacecraft by the spacecraft electric potential on its surfaces. The return of ionized contaminant molecules to charged spacecraft surfaces is very important to all altitudes. It is especially important at geosynchronous and interplanetary environments, since it may be the only mechanism by which contaminants can degrade a surface. This model is applicable to all altitudes and spacecraft geometries. In addition, results of the model will be completed to cover a wide range of potential space systems.

CR—2003–212638

August 2003

TID Effects of High-Z Material Spot Shields on FPGA Using MPTB Data. S.H. Crain, J.E. Mazur, and M.D. Looper. NASA's Space Environments and Effects Program, and The Aerospace Corporation.

An experiment on the Microelectronics and Photonics Test Bed (MPTB) was testing field programmable gate arrays using spot shields to extend the life of some of the devices being tested. It was expected that the unshielded parts would fail from a total ionizing dose (TID) and yet the opposite occurred. The data show that the devices failing from the TID effects are those with the spot shields attached. This effort is to determine the mechanism by which the environment is interacting with the high-Z material to enhance the TID in these field programmable gate arrays.

MSFC ABSTRACTS, ARTICLES, PAPERS, AND PRESENTATIONS CLEARED FOR DISSEMINATION
(Publicly available. Dates are conference dates.)

ABBAS, M.M.	SD50	Initiating Sustainable Operations at Marshall Space Flight Center—Abstract Only. For presentation at the 8th Annual
CRAVEN, P.D.	SD50	Joint Services Pollution Prevention & Hazardous Waste
SPANN, J.F.	SD50	Management Conference, San Antonio, TX, August 11–
TANKOSIC, D.	UAH	14, 2003.
LECLAIR, A.	UAH	
WITHEROW, W.K.	SD50	
CAMATE, R.	UAB	ADAMS, J.H. SD46
GERAKINES, P.	UAB	Radiation Shielding for Manned Deep Space Missions—
Laboratory Measurements of Optical Properties of		Abstract Only. For presentation at the Radiation Safety
Micron Size Individual Dust Grains—Abstract Only.		for Manned Mission to Mars Conference, Dubna, Russia,
For presentation at and publication in Proceedings of the		September 20–October 2, 2003.
Comprehensive International Symposium on Cosmic Dust,		
Estes Park, CO, May 26–30, 2003.		
ABBAS, M.M.	SD50	ADAMS, J.H. SD50
CRAVEN, P.D.	SD50	BERAT, C. LPSC
SPANN, J.F.	SD50	LEBRUM, D. LPSC
TANKOSIC, D.	UAH	MONTANET, F. LPSC
WITHEROW, W.K.	SD50	The Light of the Night Sky in EUSO: Duty Cycle and
LECLAIR, A.	UAH	Background—Abstract Only. For presentation at and
WEST, E.A.	SD50	publication in Proceedings of the 28th International Cos-
SHELDON, R.	UAH	mic Ray Conference, Tsukuba, Japan, July 31–August 7,
GALLAGHER, D.L.	SD50	2003.
THOMAS, E.	Auburn University	ADAMS, J.H. SD50
Radiation Pressure Measurements on Micron Size Indi-		CHRISTL, M.J. SD50
vidual Dust Grains—Abstract Only. For publication in the		A Ground-Based UV Light Source for the EUSO Mission—
Journal of Geophysical Research, 2003.		Abstract Only. For presentation at and publication in
		Proceedings of the 28th International Cosmic Ray Con-
		ference, Tsukuba, Japan, July 31–August 7, 2003.
ABYZOV, S.S.	Institute of Microbiology	
HOOVER, R.B.	SD50	ADAMS, J.H. SD50
IMURA, S.	National Institute of Polar Research	HOWELL, L.W., JR. SD50
MITSKEVICH, I.N.	Institute of Microbiology	Depth Distribution of the Maxima of Extensive Air
NAGANUMA, T.	Hiroshima University	Shower—Abstract Only. For presentation at and publica-
POGLAZOVA, M.N.	Institute of Microbiology	tion in the 28th International Cosmic Ray Conference,
IVANOV, M.V.	Institute of Microbiology	Tsukuba, Japan, July 31–August 7, 2003.
Comparative Results of Using Different Methods for		
Discovery of Microorganisms in Very Ancient Layers of the		ADAMS, J.H. SD50
Central Antarctic Glacier Above Lake Vostok—Abstract		KOUZNETSOV, E. UAH
Only. For publication in Proceedings of the 34th COSPAR		The Zero-Degree Detector System—Abstract Only.
Scientific Assembly/World Space Congress, Houston, TX,		For presentation at the 28th International Cosmic Ray
October 10–19, 2002.		Conference, Tsukuba, Japan, July 31–August 7, 2003.
ADAMO, C.	ISAC-CNR, Roma	ADAMS, J.H. SD50
SOLOMON, R.	ISAC-CNR, Roma	NAGANO, M. SD50
GOODMAN, S.J.	SD60	AGASA Results and EUSO—Abstract Only. For
DIETRICH, S.	ISAC-CNR, Roma	presentation at the 28th International Cosmic Ray Con-
MAGNAI, A.	ISAC-CNR, Rom	ference, Tsukuba, Japan, July 31–August 7, 2003.
Lightning and Precipitation: Observational Analysis of		
LIS and PR—Abstract Only. For presentation at the 5th		ADAMS, M.L. SD50
Plinius Conference on Mediterranean Storms, Ajaccio,		NASA's Space Science Programming Possibilities for
Corsica, France, October 1–3, 2003.		Planetaria—Abstract Only. For presentation at the SEPA
		2003 Conference, Baton Rouge, LA, June 17–21, 2003.
ADAMS, D.E.	AD10	
ORRELL, J.	CH2M HILL, Inc.	

MSFC ABSTRACTS, ARTICLES, PAPERS, AND PRESENTATIONS CLEARED FOR DISSEMINATION
(Publicly available. Dates are conference dates.)

ADAMS, M.L.	SD50	ADAMS, R.B.	TD03
ELSNER, R.F.	SD50	STATHAM, G.	ERC, Inc.
KOUVELIOTOU, C.	SD50	WHITE, S.	ERC, Inc.
PATEL, S.K.	SD50	PATTON, B.W.	TD03
PREECE, R.D.	SD50	THIO, Y.C.F.	Dept. of Energy
STRONG, C.	SD50	ALEXANDER, R.	TD03
WILSON, C.A.	SD50	FINCHER, S.	TD03
WOODS, P.M.	SD50	POLSGROVE, T.	TD03
Using the Chandra Project to Communicate With Underdeveloped Constituencies—Abstract Only. For presentation at the Meeting on Communicating Astronomy to the Public, Washington, DC, October 1–3, 2003.		CHAPMAN, J.	TD03
		ET AL.	
		Crewed Mission to Callisto Using Advanced Plasma Propulsion Systems—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
ADAMS, M.L.	SD50		
GALLAGHER, D.L.	SD50		
KOCZOR, R.J.	SD50	ADAMS, R.B.	TD30
NASA/NSSTC Science Communication Roundtable—Abstract Only. For publication in Proceedings of the Astronomical Society of the Pacific Conference Series, Berkeley, CA, September 28–29, 2002.		STATHAM, G.	ERC, Inc.
		WHITE, S.	ERC, Inc.
		PATTON, B.W.	TD40
		THIO, Y.C.F.	Dept. of Energy
		SANTARIUS, J.	University of Wisconsin
ADAMS, M.L.	SD50	ALEXANDER, R.	TD30
GALLAGHER, D.L.	SD50	FINCHER, S.	TD30
WHITT, A.	Fernbank Science Center	POLSGROVE, T.	TD30
Issues in Informal Education: Event-Based Science Communication Involving Planetaria and the Internet—Abstract Only. For publication in Proceedings of the Astronomical Society of the Pacific Conference Series, Berkeley, CA, September 28–29, 2002.		CHAPMAN, J.	TD30
		Crewed Mission to Callisto Using Advanced Plasma Propulsion Systems—Final Paper. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.	
ADAMS, M.L.	SD50	ADRIAN, M.L.	UAH
PHILLIPS, T.	SD50	GALLAGHER, D.L.	SD50
WHITT, A.	SD50	AVANOV, L.A.	SD50
Collaborating With Planetaria to Improve Girl Scouts' Appreciation of Astronomy—Abstract Only. For presentation at the 202nd American Astronomical Society Meeting, Nashville, TN, May 25–29, 2003.		IMAGE EUV Observation of a Radially, Bifurcated Plasmopause: First Observations of a Possible Standing ULF Waveform in the Inner Magnetosphere—Abstract Only. For publication in the Journal of Geophysical Research—Space Physics, 2003.	
ADAMS, R.B.	TD03		
STATHAM, G.	ERC, Inc.	AHMED, R.	ED23
HOPKINS, R.	TD03	JOHNSTON, A.S.	ED23
CHAPMAN, J.	TD03	GARRISON, J.C.	ED23
WHITE, S.	ERC, Inc.	GAINES, J.L.	ED23
BONOMETTI, J.	TD03	WAGGONER, J.D.	ED23
ALEXANDER, R.	TD03	Design and Demonstration of Bolt Retractor Separation System for X-38 Deorbit Propulsion Stage—Final Paper. For presentation at the European Space Mechanisms and Tribology Symposium, San Sebastain, Spain, September 24–26, 2003.	
FINCHER, S.	TD03		
POLSGROVE, T.	TD03		
KALKSTEIN, M.	TD03		
Planetary Defense: Options for Deflection of Near Earth Objects—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		AHN, H.S.	University of Maryland
		ADAMS, J.H.	SD50
		BASHINDZHAGYAN, G.L.	Moscow State University
		BATKOV, K.E.	Moscow State University

MSFC ABSTRACTS, ARTICLES, PAPERS, AND PRESENTATIONS CLEARED FOR DISSEMINATION
(Publicly available. Dates are conference dates.)

CHANG, J.	Max Planck Institute	AHN, H.S.	University of Maryland
CHRISTL, M.J.	SD50	ADAMS, J.H.	SD50
FAZLEY, A.R.	Southern University	BASHINDZHAGYAN, G.L.	Moscow State University
GANEL, O.	SD50	BATKOV, K.E.	Moscow State University
GUNASINGHA, R.M.	Southern University	CHANG, J.	Max Planck Institute
GUZIK, T.G.	Louisiana State University	CHRISTL, M.J.	SD50
ATIC Experiment: Flight Data Processing—Abstract Only.		COX, M.	SD50
For presentation at the 28th International Cosmic Ray Conference, Tsukuba, Japan, July 31–August 7, 2003.		ELLISON, S.B.	Louisiana State University
		FAZLEY, A.R.	Southern University
		GANEL, O.	University of Maryland
		ATIC Experiment: Preliminary Results From the Flight in 2002—Abstract Only. For presentation at the 28th International Cosmic Ray Conference, Tsukuba, Japan, July 31–August 7, 2003.	
ALBARADO, T.	University of Louisiana	AHN, H.S.	University of Maryland
HOLLERMAN, A.	University of Louisiana	ADAMS, J.H.	SD50
EDWARDS, D.L.	ED31	BASHINDZHAGYAN, G.L.	Moscow State University
HUBBS, W.	ED31	BATKOV, K.E.	Moscow State University
SEMME, C.	Qualis Corporation	CHANG, J.	Max Planck Institute
Electron Exposure Measurements of Candidate Solar Sail Materials—Final Paper. For presentation at the International Solar Energy Conference, Kohala Coast, HI, March 16–18, 2003.		CHRISTL, M.J.	SD50
		FAZLEY, A.R.	Southern University
ALBYN, K.	ED31	GANEL, O.	University of Maryland
EDWARDS, D.L.	ED31	GUNASINGHA, R.M.	Southern University
ALRED, J.	Boeing	GUZIK, T.G.	Louisiana State University
Changes in Optical Properties of Simulated Shuttle Waste Water—Urine Darkening—Final Paper. For publication in the Journal of Spacecraft and Rockets, 2003.		ATIC Experiment: Elemental Spectra From the Flight in 2000—Abstract Only. For presentation at the 28th International Cosmic Ray Conference, Tsukuba, Japan, July 31–August 7, 2003.	
ALLEN, P.A.	ED22	ANILKUMAR, A.V.	SD46
AGGARWAL, P.K.	ED22	GRUGEL, R.N.	SD46
SWANSON, G.R.	ED22	LEE, C.P.	SD46
Development of a Fatigue Crack Growth Coupon for Highly Plastic Stress Conditions—Final Paper. For presentation at and publication in Proceedings of the 45th AIAA/ASME/ASCE/AHA/ASC Structures, Structural Dynamics, and Materials Conference, Palm Springs, CA, April 19–22, 2004.		BHOWMICK, J.	SD46
		WANG, T.G.	SD46
		Experiments on Suppression of Thermocapillary Oscillations in Float-Zones by High-Frequency End-Wall Vibrations—Abstract Only. For publication in Physics of Fluids, 2003.	
ALLEN, P.A.	ED22	ARAKERE, N.K.	University of Florida
WILSON, C.D.	Tennessee Technological University	KNUDSEN, E.C.	University of Florida
Hydrostatic Stress Effect on the Yield Behavior of Inconel 100—Final Paper. For publication in the Journal of Mechanical Behavior of Materials, 2003.		DUKE, G.	ED22
		BATTISTA, G.	ED22
ALOOR, S.	University of Texas	SWANSON, G.R.	ED22
NOWAK, B.	Sandia National Laboratories	Subsurface Stress Fields in Single Crystal (Anisotropic) Contacts—Abstract Only. For presentation at the ASME Turbo Expo, Vienna, Austria, June 14–17, 2004; and for publication in the Journal of Engineering for Gas Turbines and Power, 2003.	
VARGAS, R.	University of Texas	ARUMUGAM, M.	Western Michigan University
MCCLURE, J.C.	University of Texas	LAM, N.	Louisiana State University
MURR, L.E.	University of Texas	EMERSON, C.	Western Michigan University
NUNES, A.C., JR.	ED30	QUATTROCHI, D.A.	SD60
Macrostructure of Friction Stir Welds—Final Paper. For publication in Science and Technology of Welding and Joining, London, UK, 2002.			

MSFC ABSTRACTS, ARTICLES, PAPERS, AND PRESENTATIONS CLEARED FOR DISSEMINATION
(Publicly available. Dates are conference dates.)

- Classifying Urban Land Covers Using Local Indices of Spatial Complexity—Abstract Only. For presentation at the American Society for Photogrammetry and Remote Sensing Annual Conference, Anchorage, AK, May 3–9, 2003.
- AVANOV, L.A. SD50
CHANDLER, M.O. SD50
SMIRNOV, V.N. SD50
VAISBERG, O.L. SD50
What are the Causes of the Formation of the Sub-Alfvenic Flows at the High Latitude Magnetopause?—Abstract Only. For presentation at and publication in Proceedings of the American Geophysical Union Fall Meeting, San Francisco, CA, December 8–12, 2003.
- BAGGETT, R.M. TD15
JOHNSON, L. TD15
WERCINSKI, P. NASA Headquarters
In-Space Propulsion Program Overview and Status—Abstract Only. For presentation at the International Electric Propulsion Conference, Toulouse, France, March 17–21, 2003.
- BALLARD, R.O. TD51
COBRA System Engineering Processes to Achieve SLI Strategic Goals—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.
- BARLOW, D.A. UAH
BAIRD, J.K. UAH
SU, C.-H. SD46
A Theory of the Von Wiemarn Rules Governing the Average Size of Crystals Precipitated From a Supersaturated Solution—Abstract Only. For publication in the Journal of Crystal Growth, 2003.
- BARNES, C.L. SD40
SNELL, E.H. BAE Systems
KUNDROT, C.E. SD40
Thaumatococcus Crystallization Aboard the *International Space Station* Using Liquid-Liquid Diffusion in the Enhanced Gaseous Nitrogen Dewar (EGN)—Final Paper. For publication in *Acta Crystallographica*, 2003.
- BARRET, C. TD40
Nuclear Electric Propulsion for Outer Space Missions—Abstract Only. For presentation at the Society of Women Engineers Conference, Birmingham, AL, October 9–11, 2003.
- BASHINDZHAGYAN, G.L. Moscow State University
ADAMS, J.H. SD50
BASHINDZHAGYAN, P. Moscow State University
BARANOVA, N. Moscow State University
CHRISTL, M.J. SD50
CHILINGARIAN, A. Yerevan Physics Institute
CHURPIN, I. Joint Institute for Nuclear Research
DERRICKSON, J. SD50
DRURY, L. Dublin Institute
EGOROV, N. Research Institute of Materials Science
Accelerator Tests of the KLEM Prototypes—Abstract Only. For presentation at the 28th International Cosmic Ray Conference, Tsukuba, Japan, July 31–August 7, 2003.
- BASHINDZHAGYAN, G.L. Moscow State University
ADAMS, J.H. SD50
BASHINDZHAGYAN, P. Moscow State University
BARANOVA, N. Moscow State University
CHRISTL, M.J. SD50
CHILINGARIAN, A. Yerevan Physics Institute
CHURPIN, I. Joint Institute for Nuclear Research
DERRICKSON, J. SD50
DRURY, L. Dublin Institute
EGOROV, N. Research Institute of Material Science
NUCLEON Satellite Mission, Status and Plans—Abstract Only. For presentation at the 28th International Cosmic Ray Conference, Tsukuba, Japan, July 31–August 7, 2003.
- BASSO, S. Osservatorio Astronomico di Brera
BRUNI, R.J. Harvard
CITERIO, O. Osservatorio Astronomico di Brera
ENGELHAUPT, D. UAH
GHIGO, M. Osservatorio Astronomico di Brera
GORENSTIEN, P. Harvard
MAZZOLENI, F. Osservatorio Astronomico di Brera
O'DELL, S.L. SD50
PARESCI, G. Osservatorio Astronomico di Brera
RAMSEY, B.D. SD50
Development of a Prototype Nickel Optic for the Constellation-X Hard-X-Ray Telescope—Abstract Only. For presentation at and publication in Proceedings of the Optics for EUV, X-Ray, and Gamma-Ray Astronomy Conference, San Diego, CA, August 3–8, 2003.
- BAUGHER, C.R. SD41
First Post-Flight Statur Report for the Microgravity Science Glovebox—Abstract Only. For presentation at the 41st AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 6–9, 2003.
- BECKER, W.E. Max Planck Institute
SWARTZ, D.A. USRA
PAVLOV, G.G. Penn State University
ELSNER, R.F. SD50
GRINDLAY, J. Harvard-Smithsonian
MIGNANI, R. European Southern Observatory

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(Publicly available. Dates are conference dates.)

TENNANT, A.F.	SD50	BLACKWELL, W.C.	Jacobs Sverdrup
BACKER, D.	University of California	MINOW, J.I.	Jacobs Sverdrup
WEISSKOPF, M.C.	SD50	SMITH, S.	Jacobs Sverdrup
Chandra X-Ray Observatory Observations of the Globular Cluster M28 and Its Millisecond Pulsar PSR B1821-24—Abstract Only. For publication in The Astrophysical Journal, 2003.		SWIFT, W.R.	Raytheon ITSS
		O'DELL, S.L.	SD40
		CAMERON, R.A.	Harvard-Smithsonian
		The Chandra X-Ray Observatory Radiation Environment Model—Abstract Only. For presentation at the 41st AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 6-9, 2003.	
BEMPORAD, A.	SD50		
POLETTI, G.	SD50	BLAKESLEE, R.J.	SD60
ROMOLI, M.	SD50	BAILEY, J.C.	Raytheon
SUESS, S.T.	SD50	PINTO, O.	INPE
Preliminary Analysis of a CME Observed by SOHO and Ulysses Experiments—Abstract Only. For publication in the ESA SP 2003-23, 2003.		ATHAYDE, A.	INMET
		RENNO, N.	University of Michigan
		WEIDMAN, C.D.	University of Arizona
BEMPORAD, A.	SD50	The Rondonia Lightning Detection Network: Network Description Science Objectives, Data Processing/Archival Methodology, and Results—Abstract Only. For presentation at the International Conference on Atmospheric Electricity, Versailles, France, June 9-13, 2003.	
POLETTI, G.	SD50		
SUESS, S.T.	SD50	BLAKESLEE, R.J.	SD60
KO, Y.	SD50	CROSKEY, C.L.	Penn State University
PARENTI, S.	SD50	DESCH, M.D.	Goddard Space Flight Center
RILEY, P.	SD50	FARRELL, W.M.	Goddard Space Flight Center
ROMOLI, M.	SD50	GOLDBERG, R.A.	Goddard Space Flight Center
ZURBUCHEN, T.	SD50	HOUSER, J.G.	Goddard Space Flight Center
Temporal Evolution of a Streamer Complex: Coronal and In Situ Plasma Parameters—Abstract Only. For publication in The Astrophysical Journal, 2003.		KIM, H.S.	SD60
		MACH, D.M.	UAH
BERNHARDSDOTTER, E.	SD46	MITCHELL, J.D.	Penn State University
GARRIOTT, O.	SD46	STONEBURNER, J.C.	Aeronautical Systems, Inc.
PUSEY, M.L.	SD46	The Altus Cumulus Electrification Study (ACES): A UAV-Based Science Demonstration—Abstract Only. For presentation at the International Conference on Atmospheric Electricity, Versailles, France, June 9-13, 2003.	
NG, J.D.	SD46		
Two Strategies for Microbial Production of an Industrial Enzyme-Alpha-Amylase—Abstract Only. For presentation at Student Research Day, The University of Alabama in Huntsville, Huntsville, AL, April 11, 2003.		BLEVINS, J.A.	TD40
		GOSTOWSKI, R.	TD40
BEST, S.	FD41	CHIANESE, S.	Penn State University
NICHOLS, K.F.	FD41	An Experimental Investigation of Hypergolic Ignition Delay of Hydrogen Peroxide With Fuel Mixtures—Abstract Only. For presentation at the 42nd AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 5-8, 2004.	
BRADFORD, R.N.	FD41		
Utilization of Internet Protocol-Based Voice Systems in Remote Payload Operations—Viewgraphs Only. For presentation at the Ground System Architectures Workshop, Manhattan Beach, CA, March 4-6, 2003.		BLEVINS, J.A.	TD40
		RODGERS, S.L.	TD40
BJORKMAN, G.	Lockheed Martin	Propulsion Research at the Propulsion Research Center of the NASA Marshall Space Flight Center—Abstract Only. For presentation at the 54th International Astronautical	
CANTRELL, M.	Lockheed Martin		
CARTER, R.R.	ED33		
Self-Reacting Friction Stir Welding for Aluminum Alloy Circumferential Weld Application—Abstract and Presentation. For presentation at the AeroMat 2003 Conference, Dayton, OH, June 9-12, 2003.			

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(Publicly available. Dates are conference dates.)

Congress, Bremen, Germany, September 29–October 3, 2003.

BOCCIPPIO, D.J. SD60
Archetypal TRMM Radar Profiles Identified Through Cluster Analysis—Abstract Only. For presentation at the 31st Conference on Radar Meteorology, Seattle, WA, August 6–12, 2003.

BOCCIPPIO, D.J. SD60
A Step Beyond Simple Keyword Searches: Services Enabled by a Full Content Digital Journal Archive—Abstract Only. For presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 8–12, 2003.

BOCCIPPIO, D.J. SD60
Objective Classification of Radar Profile Types, and Their Relationship to Lightning Occurrence—Abstract Only. For presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 8–12, 2003.

BOECK, W.L. Niagara University
JACOBSON, A.R. Los Alamos National Laboratory
CHRISTIAN, H.J. SD60
GOODMAN, S.J. SD60
Multi-Satellite Observations of Oceanic Lightning—Abstract Only. For presentation at the International Conference on Atmospheric Electricity, Versailles, France, June 9–13, 2003.

BORDELON, W.J., JR. TD07
FROST, A.L. TD07
REED, D.K. TD07
Stage Separation Wind Tunnel Tests of a Generic Two-Stage-To-Orbit Launch Vehicle—Final Paper. For presentation at the AIAA Applied Aerodynamics Conference, Orlando, FL, June 23–26, 2003.

BORGSTAHL, G. SD46
LOVELACE, J. SD46
SNELL, E.H. SD46
BELLAMY, H. SD46
Towards the Structure Determination of a Modulated Protein Crystal: The Semicrystalline State of Profilin: Actin—Abstract Only. For presentation at the American Crystallographic Association Meeting, Covington, KY, July 26–31, 2003.

BOUVIER, C. Lockheed Martin
RUSSELL, S.S. ED32
WALKER, J.L. ED32
WILKERSON, C. ED32

Thermographic Inspection of Aerospace Tankage—Abstract Only. For presentation at the 12th ASNT Annual Research Symposium, Orlando, FL, March 9–13, 2003.

BRADFORD, R.N. FD40
Remote Instrumentation AMPATH Astronomy Working Group—Presentation. For presentation at the AMPATH Workshop Joint Astronomy Working Group, Miami, FL, January 29–31, 2003.

BRADFORD, R.N. FD40
REDMAN, S. UAH
Technology for a NASA Space-Based Science Operations Grid—Charts Only. For presentation at the Spring 2003 Internet2 Member Meeting, Arlington, VA, April 9–11, 2003.

BRADFORD, R.N. FD40
WELCH, C.L. FD40
Space-Based Operations Grid Prototype—Abstract Only. For presentation at the Mission Systems 2003: Control Center Technologies in the Third International Conference for Tech Operations, Houston, TX, August 12–15, 2003.

BRADFORD, R.N. FD40
WELCH, C.L. FD42
REDMAN, S. UAH
Space-Based Science Operations Grid Prototype—Abstract Only. For presentation at SpaceOps 2004, Montreal, Canada, May 17–21, 2004.

BRAZEL, A.J. Arizona State University
QUATTROCHI, D.A. SD60
Urban Climatology—Abstract Only. For publication in Encyclopedia of World Climates, 2003.

BROWN, R.J. Lockheed Martin
SCHNEIDER, J. Lockheed Martin
HARTLEY, P. Lockheed Martin
RUSSELL, C. MP
LAWLESS, K. MP
JONES, C. MP
Self-Reacting Friction Stir Welding for Aluminum Complex Curvature Applications—Presentation. For presentation at the AeroMat 2003 Conference, Dayton, OH, June 9–12, 2003.

BROWN, R.J. Lockheed Martin
SCHNEIDER, J. Lockheed Martin
HARTLEY, P. Lockheed Martin
RUSSELL, C. MP
LAWLESS, K. MP
JONES, C. MP

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- 2xxx Aluminum Self-Reacting Friction Stir Welding Development—Presentation. For presentation at the AeroMat 2003 Conference, Dayton, OH, June 9–12, 2003.
- BUECHLER, D.E. UAH
MACH, D.M. UAH
BLAKESLEE, R.J. SD60
Relationships Between Electrical and Radar Characteristics of Thunderstorms Observed During ACES—Abstract Only. For presentation at the International Conference on Atmospheric Electricity, Versailles, France, June 9–13, 2003.
- CALVIGNAC, J. Northrop Grumman
DANG, L. Northrop Grumman
TRAMEL, T.L. TD07
PASEUR, L. TD07
Design and Testing of Non-Toxic RCS Thrusters for Second-Generation Reusable Launch Vehicle—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.
- CAMPBELL, J.W. FD02
PHIPPS, C. FD02
SMALLEY, L. UAH
REILY, J.C. UAH
BOCCIO, D. City University of NY
The IMPACT IMPERATIVE—Laser Ablation for Deflecting Asteroids, Meteoroids, and Comets From Impacting the Earth—Extended Abstract. For presentation at the First International Symposium on Beamed Energy Propulsion, Huntsville, AL, November 5–7, 2002.
- CAMPBELL, J.W. FD02
SMALLEY, L. UAH
BOCCIO, D. City University of NY
Laser Prevention of Earth Impact Disasters—Final Paper. For presentation at the 53rd International Astronautical Congress, The World Space Congress—2002, Houston, TX, October 10–19, 2002.
- CARPENTER, D.L. Stanford University
BELL, R.F. Stanford University
INAN, U.S. Stanford University
BENSON, R.F. Goddard Space Flight Center
REINISCH, B.W. University of Massachusetts
GALLAGHER, D.L. SD50
Status of the Node 3 Regenerative ECLSS Water Recovery and Oxygen Generation Systems—Final Paper. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–11, 2003.
- CARPENTER, D.L. Stanford University
BELL, R.F. Stanford University
INAN, U.S. Stanford University
BENSON, R.F. Goddard Space Flight Center
REINISCH, B.W. University of Massachusetts
GALLAGHER, D.L. SD50
Z-Mode Sounding Within Propagation “Cavities” and Other Inner Magnetospheric Regions by the RPI Instrument on the IMAGE Satellite—Abstract Only. For publication in the Journal of Geophysical Research, 2003.
- CARPENTER, P.K. SD46
SEBILLE, L. SD46
BOLES, W. Middle Tennessee State University
CHADWELL, M. University of South Alabama
SCHWARZ, L. UAH
JSC Mars-1 Martian Soil Simulant: Melting Experiments and Electron Microprobe Studies—Abstract Only. For publication in Microscopy and Microanalysis, 2003.
- CARRASQUILLO, R. FD21
Status of the Node 3 Regenerative ECLSS Water Recovery and Oxygen Generation Systems—Final Paper. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.
- CARTER, L. FD21
O’CONNER, E. Hamilton Sundstrand
SNOWDON, D. Hamilton Sundstrand
Performance of WPA Conductivity Sensor During Two-Phase Fluid Flow in Microgravity—Final Paper. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.
- CASAS, J. SD10
NALL, M. SD10
Enabling Sustainable Exploration Through the Commercial Development of Space—Abstract Only. For presentation at the 54th International Astronautical Congress, Bremen, Germany, September 29–October 3, 2003.
- CHAKRABARTI, S. TD40
MARTIN, J.J. TD40
PEARSON, J.B. TD40
LEWIS, R.A. R. Lewis Co.
Developing Antimatter Containment Technology: Modeling Charged Particle Oscillations in a Penning-Malmberg Trap—Abstract Only. For presentation at the 18th International Conference on Numerical Simulation of Plasmas, Falmouth, MA, September 7–10, 2003.

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CHANDLER, M.O.	SD50	presentation at the 39th AIAA/ASME/SAE/ASEE Joint
AVANOV, L.A.	SD50	Propulsion Conference/Exhibit, Huntsville, AL, July 20–
Observations at Low Latitudes of Magnetic Merging		23, 2003.
Signatures Within a Flux Transfer Event During a		
Northward IMP—Abstract Only. For publication in the		CHRISTIAN, H.J.
Journal of Geophysical Research, 2003.		SD60
		Global Lightning Activity—Abstract Only. For presentation
		at the International Conference on Atmospheric Electricity,
		Versailles, France, June 9–13, 2003.
CHANDLER, M.O.	SD50	
MOORE, T.E.	SD50	
Observations of the Geopause at the Equatorial Magneto-		CIPELLETTI, L.
pause: Density and Temperature—Abstract Only. For		SD46
publication in Geophysical Research Letters, 2003.		PRASAD, V.
		SD46
		DINSMORE, A.
		SD46
		SEGRE, P.N.
		SD46
CHANG, J.	Max Planck Institute	WEITZ, D.A.
SCHMIDT, W.K.H.	Max Planck Institute	SD46
ADAMS, J.H.	SD50	TRAPPE, V.
AHN, H.S.	University of Maryland	SD46
BASHINDZHAGYAN, G.L.	Moscow State University	Universal Features of the Fluid to Solid Transition for
BATKOV, K.E.	Moscow State University	Attractive Colloidal Particles—Abstract Only. For
CHRISTL, M.J.	SD50	publication in Faraday Discussions, Vol. 123, 2002/2003.
FAZLEY, A.R.	Southern University	
GANEL, O.	University of Maryland	CISZAK, E.
GUNASINGHA, R.M.	Southern University	SD46
High-Energy Cosmic Ray Electron Spectra Measured		DOMINIAC, P.M.
From the ATIC Balloon Experiment—Abstract Only.		SD46
For presentation at the 28th International Cosmic Ray		Structure-Derived Proton-Transfer Mechanism for Action
Conference, Tsukuba, Japan, July 31–August 7, 2003.		of Human Pyruvate Dehydrogenase—Abstract Only.
		For presentation at the University of Plymouth, UK,
		August 26, 2003.
		CISZAK, E.
		SD46
		DOMINIAC, P.M.
		SD46
		Structural Model for the “Flip-Flop” Action in
		Thiamin Pyrophosphate—Dependent Human Pyruvate
		Dehydrogenase—Abstract Only. For presentation at the
		Gordon Research Conference, Meriden, NH, July 13–18,
		2003.
CHAUVERS, D.G.	TD40	
Momentum and Heat Flux Measurements in the Exhaust		
of Vasimr Using Helium Propellant—Abstract Only. For		
presentation at the 28th International Electric Propulsion		
Conference, Toulouse, France, March 17–21, 2003.		
CHAUVERS, D.G.	TD40	CISZAK, E.
IRVINE, C.	TD40	SD46
CHANG-DIAZ, F.R.	JSC	UAH
SQUIRE, J.P.	Muniz Engineering	KOROTCHKINA, L.G.
Momentum and Heat Flux Measurements in the Exhaust		SUNY at Buffalo
of Vaimr Using Helium Propellant—Final Paper. For		DOMINIAC, P.M.
presentation at the 28th International Electric Propulsion		SD46
Conference, Toulouse, France, March 17–21, 2003.		SIDHU, S.
		SUNY at Buffalo
		PATEL, M.S.
		SUNY at Buffalo
		Structural Basis for “Flip-Flop” Action of Human
		Pyruvate Dehydrogenase—Presentation. For presentation
		at the American Crystallographic Association Meeting,
		Cincinnati, OH, July 26–31, 2003.
CHOUDHARY, D.P.	SD50	
MOORE, R.L.	SD50	CISZAK, E.
Filament Eruption Without Coronal Mass Ejection—		SD46
Abstract Only. For publication in Geophysical Research		KOROTCHKINA, L.G.
Letters, 2003.		SD46
		DOMINIK, P.M.
		SD46
		SIDHU, S.
		SD46
		PATEL, M.S.
		SD46
CHRISTENSON, R.L.	TD61	Structural Basis for Flip-Flop Action of Thiamin
NELSON, M.A.	TD51	Pyrophosphate-Dependent Enzymes Revealed by Crystal
BUTAS, J.P.	TD53	Structure of Human Pyruvate Dehydrogenase—Abstract
Rocket Engine Health Management—Early Definition		Only. For publication in the Journal of Biological
of Critical Flight Measurements—Final Paper. For		Chemistry, 2003, and The Science Journal, 2003.

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COE, M.J.	Southampton University	the AIAA/ICAS International Air and Space Symposium,
HAIGH, N.J.	Southampton University	Dayton, OH, July 14–17, 2003.
WILSON, C.A.	SD50	
NEGUERUELA, I.	SAX SDC	CURRERI, P.A. SD46
XTE J0111.2-7316: An X-Ray Binary in the SMC—		In Space Fabrication and Repair Utilizing in Space
Abstract Only. For publication in MNRAS, 2003.		Resources—Abstract Only. For presentation at the Center
		for Commercial Applications of Combustion in Space
		Annual Meeting, Golden, CO, September 24–26, 2003.
COLE, J.W.	TD40	
Advanced Propulsion Research Interest in Materials for		CURRERI, P.A. SD46
Propulsion—Charts Only. For presentation at the Materials		Through Microgravity and Towards the Stars: Microgravity
Science for Advanced Space Propulsion Workshop,		and Strategic Research at Marshall's Biological and
Huntsville, AL, May 15–16, 2003.		Physical Space Research Laboratory—Abstract Only. For
		presentation at the Gordon Research Conference, London,
		CT, July 27–August 1, 2003.
COLE, J.W.	TD40	
NASA/MSFC Interest in Advanced Propulsion and		CUTTEN, D.R. SD60
Power Technologies—Charts Only. For presentation at		JARZEMBSKI, M.A. SD60
EETEAMS, Huntsville, AL, April 2, 2003.		SRIVASTAVA, V. USRA
		PUESCHEL, R.F. USRA
COOKE, W.J.	ED44	HOWARD, S.D. USRA
SUGGS, R.M.	ED44	MCCAUL, E.W., JR. USRA
Practical Meteor Stream Forecasting—Abstract Only.		Boundary Layer Aerosol Composition Over Sierra
For presentation at the Leonid MAC Conference, Ames		Nevada Mountains Using 9.11- and 10.59- μ m CW
Research Center, August 28–30, 2003.		Lidars and Modeled Backscatter From Size Distribution
		Data—Abstract Only. For publication in the Journal of
		Geophysics, 2003.
CRAVEN, P.D.	SD50	
ABBAS, M.M.	SD50	DAVIS, J.M. SD50
TANKOSIC, D.	UAH	MOORE, R.L. SD50
SPANN, J.F.	SD50	HATHAWAY, D.H. SD50
Measurement of Characteristics of Micron-Size Individual		Beyond Solar-B: MTRAP, the Magnetic Transition Region
Dust Particles of Astrophysical Interest—Abstract Only.		Probe—Abstract Only. For presentation at the AAS Solar
For presentation of the 10th Workshop on the Physics of		Physics Division, Laurel, MD, June 16–20, 2003.
Dusty Plasma, St. Thomas, U.S. Virgin Islands, June 18–		
21, 2003.		
CREECH, S.D.	VS20	
Orbital Space Plane Cost Credibility—Abstract Only.		DAVIS, S. UP50
For presentation at the 54th International Astronautical		ENGLER, L. Morgan Research
Congress, Bremen, Germany, September 29–October 3,		FISHER, M.F. UP50
2003.		DUMBACHER, D.L. UP01
		BOSWELL, B. JSC
CROELL, A.	Technische Universitat	NASA's New Orbital Space Plane: "A Bridge to the
LANTZSCH, R.	Technische Universitat	Future"—Final Paper. For presentation at the AIAA/ICAS
KITANOV, S.	Technische Universitat	International Air and Space Symposium, Dayton, OH,
SALK, N.	SD46	July 14–17, 2003.
SZOFRAN, F.R.	SD46	
TEGETMEIER, A.	Kristallographisches Institute	DAVIS, S.E. ED36
Melt-Crucible Wetting Behavior in Semiconductor Melt		WISE, H.L. ICRC
Growth Systems—Abstract Only. For publication in		Obtaining NASA Approval for Use of Non-Metallic
Crystal Research and Technology, 2003.		Materials in Manned Space Flight—Final Paper. For
		presentation at and publication in Proceedings of the
		SAMPE International Symposium & Exhibition, Long
		Beach, CA, May 11–15, 2003.
CULBERTSON, A.	Defense Res. & Eng.	
BHAT, B.	ED33	
The National Aerospace Initiative (NAI): Technologies for		
Responsive Space Access—Final Paper. For presentation at		

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DING, R.J.	ED33	TRAN, K.	Boeing-Rocketdyne
Thermal Stir Welding—A New Solid State Welding Process—Abstract Only. For presentation at the National Design and Engineering Show, Chicago, IL, March 3–7, 2003, and at the ASM Materials Solutions Conference, Columbus, OH, October 7–9, 2002.		SARGENT, S.	Boeing-Rocketdyne
		Calculation of Turbine Axial Thrust by Coupled CFD Simulations of the Main Flow Path and Secondary Cavity Flow in an SLI Lox Turbine—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
DOBSON, C.	TD40	DORNEY, D.J.	TD64
HRBUD, I.	ERC, Inc.	ROTHERMEL, J.	TD64
Research Status of IEC Experiments at NASA Marshall—Presentation. For presentation at the 5th U.S./Japanese IEC Exchange, Madison, WI, October 9–10, 2002.		Shuttle Main Propulsion System LH ₂ Feed Line and Inducer Simulations—Presentation. For presentation at the MSFC Fall Workshop on Fluids, Huntsville, AL, November 19–21, 2002.	
DOBSON, C.	TD40	DORNEY, D.J.	TD64
JONES, J.E.	TD40	ROTHERMEL, J.	TD64
CHAUVERS, D.G.	TD40	Simulations of Flow Through the SSME LH ₂ Feed Line and LPFP Inducer—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
Instrument Reflections and Scene Amplitude Modulation in a Polychromatic Microwave Quadrature Interferometer—Final Paper. For publication in Review of Scientific Instruments, 2003.			
DORNEY, D.J.	TD64	DORNEY, D.J.	TD64
Design and Analysis of Turbomachinery for Space Applications—Presentation. For presentation at the Seminars at Wright-Patterson Air Force Base, OH, and at Wright State University, Dayton, OH, October 4, 2002.		SONDAK, D.L.	Boston University
		Development Status of the Phantom Code for Turbomachinery—Presentation. For presentation at the MSFC Spring Workshop on Fluids, Birmingham, AL, April 22–24, 2003.	
DORNEY, D.J.	TD64	DORNEY, S.M.	TD64
GRIFFIN, L.W.	TD64	CFD Process Pre- and Post-Processing Automation in Support of Space Propulsion—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
HUBER, F.W.	Riverbend Design Services		
SONDAK, D.L.	Boston University	DRAKE, B.G.	Johnson Space Center
Off-Design Performance of a Multi-Stage Supersonic Turbine—Final Paper. For presentation at the 41st AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 6–9, 2003.		COOKE, D.R.	Johnson Space Center
		KOS, L.D.	TD30
DORNEY, D.J.	TD64	NASA Exploration Team (NExT) In-Space Transportation Overview—Presentation. For presentation at the 51st JANNAF Propulsion Meeting, Lake Buena Vista, FL, November 18–21, 2002.	
GRIFFIN, L.W.	TD64	DRESSLER, G.A.	Northrop Grumman
HUBER, F.W.	Riverbend Design Services	MATUSZAK, L.W.	Northrop Grumman
SONDAK, D.L.	Boston University	STEPHENSON, D.D.	TD04
Pre- and Post-Test Predictions of the Flow in a Multi-Stage Supersonic Turbine—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		Study of a High-Energy Upper Stage for Future Shuttle Missions—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
DORNEY, D.J.	TD64		
GRIFFIN, L.W.	TD64	DUKEMAN, G.	TD54
SONDAK, D.	Boston University	Enhancements to an Atmospheric Ascent Guidance Algorithm—Final Paper. For presentation at the AIAA	
Full- and Partial-Admission Performance of the Simplex Turbine—Final Paper. For publication in the Journal of Propulsion and Power, 2003.			
DORNEY, D.J.	TD64		
MARCU, B.	Boeing-Rocketdyne		

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Guidance, Navigation, and Controls Conference, Austin TX, August 11–14, 2003.

Materials in a Space Environment, Noordwijk, The Netherlands, June 16–20, 2003.

DUMBACHER, D.L.	UP01	EFFINGER, M.	ED34
NASA's Orbital Space Plane Risk-Reduction Strategy—Final Paper. For presentation at the AIAA/ICAS International Air and Space Symposium, Dayton, OH, July 14–17, 2003.		BESHEARS, R.	ED34
		HUFNAGLE, D.	ED34
		WALKER, J.L.	ED34
		RUSSELL, S.S.	ED34
		STOWELL, B.	Lockheed Martin
DUMBACHER, D.L.	UP40	MYERS, D.	Lockheed Martin
Orbital Space Plane Program Status—Abstract Only. For presentation at the 54th International Astronautical Congress, Bremen, Germany, September 29–October 3, 2003.		Computed Tomography and Thermography Increases CMC Material and Process Development Efficiency and Testing Effectiveness—Abstract Only. For presentation at the 27th Annual Conference on Composites, Materials, and Structures, Cocoa Beach, FL, January 27–30, 2003.	
DUMBACHER, D.L.	UP01	ELAM, S.K.	TD61
Space Launch Initiative—Presentation. For presentation at the 4th European Workshop on Hot Structures and Thermal Protection Systems for Space Vehicles, Palermo, Italy, November 26–29, 2002.		HOLMES, R.	SD42
		MCKECHNIE, T.	Plasma Processes, Inc.
		HICKMAN, R.	Plasma Processes, Inc.
		PICKENS, T.	Plasma Processes, Inc.
EDWARDS, D.L.	ED31	VPS GRCop-84 Liner Development Efforts—Abstract Only. For presentation at the 52nd JANNAF Propulsion Meeting/1st Liquid Propulsion Subcommittee Meeting, Las Vegas, NV, May 10–13, 2004.	
GRAY, P.A.	ED31		
NEHLS, M.K.	ED31		
WERTZ, G.	ED31		
HUBBS, W.	ED31		
HOPPE, D.	ED31	ELSNER, R.F.	SD50
STANALAND, T.	University of Louisiana	GLADSTONE, R.	Southwest Research Institute
HOLLERMAN, A.	University of Louisiana	WAITE, H.	University of Michigan
Characterization of Candidate Solar Sail Materials Subjected to Electron Radiation—Abstract Only. For presentation at the Advanced Space Propulsion Workshop, Huntsville, AL, April 15–17, 2003.		LUGAZ, N.	University of Michigan
		MAJEED, T.	University of Michigan
		FORD, P.	MIT
		HOWELL, R.	University of Wyoming
		CRAVENS, T.	University of Kansas
		GRODENT, D.	University of Liege
EDWARDS, D.L.	ED31	BHARDWAJ, A.	Vikram Sarabhai Space
HUBBS, W.	ED31	Preliminary Results From Recent Simultaneous Chandra/HST Observations of Jupiter Auroral Zones—Abstract Only. For presentation at and publication in Proceedings of the 35th Annual Meeting of the AAS Division of Planetary Sciences, Monterey, CA, September 1–6, 2003.	
STANALAND, T.	University of Louisiana		
HOLLERMAN, A.	University of Louisiana		
ALTSTATT, R.	ED44	ELSNER, R.F.	SD50
Characterization of Space Environmental Effects on Candidate Solar Sail Material—Abstract Only. For presentation at the Propulsion Engineering Research Center 14th Annual Symposium on Propulsion, University Park, PA, December 10–11, 2002.		GLADSTONE, R.	Southwest Research Institute
		WAITE, H.	University of Michigan
		MAJEED, T.	University of Michigan
		FORD, P.	MIT
		GRODENT, D.	University of Liege
		ET AL.	
EDWARDS, D.L.	ED31	Preliminary Results From Recent Simultaneous Chandra/HST Observations of Jupiter Auroral Zones—Abstract Only. For presentation at the 202nd Meeting of the American Astronomical Society, Nashville, TN, May 25–29, 2003.	
HUBBS, W.	ED31		
STANALAND, T.	University of Louisiana		
HOLLERMAN, A.	University of Louisiana		
SEMMELE, C.	Qualis Corporation		
Characterization of Candidate Solar Sail Materials Subjected to Electron Radiation—Abstract Only. For presentation at the 9th International Symposium on			

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EMRICH, W.J., JR.	TD40	CME Prediction From Line-of-Sight Magnetogram—Abstract Only. For presentation at the AAS Solar Physics Division, Laurel, MD, June 16–20, 2003.
First Results of the Gasdynamic Mirror Fusion Propulsion Experiment—Final Paper. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.		
ENGBERG, R.C.	ED27	FALCONER, D.A. SD50
Umbilical Stiffness Matrix Characterization and Testing for Microgravity Science Payloads—Final Paper. For presentation at the AIAA Structures, Structural Dynamics and Materials Conference, Norfolk, VA, April 7–10, 2003.		MOORE, R.L. SD50
		GARY, G.A. SD50
ESKRIDGE, R.	TD40	CME Prediction From Magnetogram—Abstract Only. For presentation at the Solar, Heliospheric, and Interplanetary Environment Conference, Maui, HI, July 6–11, 2003.
MARTIN, A.K.	TD40	FALCONER, D.A. UAH
LEE, M.	TD40	MOORE, R.L. SD50
SMITH, J.W.	TD40	GARY, G.A. SD50
KOELFGEN, S.J.	UAH	HAGYARD, M.J. SD50
The Plasmoid Thruster Experiment (PTX)—Abstract and Charts. For presentation at the Advanced Space Propulsion Workshop, Huntsville, AL, April 15–17, 2003.		Forecasting Coronal Mass Ejections From Vector Magnetograms—Abstract Only. For presentation at NASA's Living With a Star Science Workshop, Laurel, MD, November 13–15, 2002.
		FALCONER, D.A. SD50
ESTES, M.G.	USRA	MOORE, R.L. SD50
QUATTROCHI, D.A.	SD60	PORTER, J.G. SD50
STASIAK, E.	Intl. City/County Mgmt. Association	HATHAWAY, D.H. SD50
The Urban Heat Island Phenomenon: How Its Effects Can Influence Environmental Decision Making in Your Community—Abstract Only. For publication in Public Management Magazine, 2003.		Solar Coronal Heating and the Magnetic Flux Content of the Network—Abstract Only. For publication in The Astrophysical Journal, 2003.
EVANS, J.P.	Yale University	FARRELL, W.M. Goddard Space Flight Center
SMITH, R.	Yale University	GOLDBERG, R.A. Goddard Space Flight Center
OGLESBY, R.J.	SD60	BLAKESLEE, R.J. SD60
Simulation of the Climate of Southwest Asia With a Regional Model—Abstract Only. For presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 5–10, 2002.		DESCH, M.D. Goddard Space Flight Center
		HOUSER, J.G. Goddard Space Flight Center
		MITCHELL, J.D. Penn State University
		CROSKY, C.L. Penn State University
		MACH, D.M. UAH
		BAILEY, J.C. Raytheon
EVANS, S.W.	ED44	ACES: A Unique Platform for Electrodynamical Studies of Upward Currents Into the Middle Atmosphere—Abstract Only. For presentation at the International Conference on Atmospheric Electricity, Versailles, France, June 9–13, 2003.
Tethers as Debris: Hydrocode Simulation of Impacts of Polymer Tether Fragments on Aluminum Plates—Final Paper. For publication in the Journal of Spacecraft and Rockets, 2003.		
FALCONER, D.A.	SD50	FAZLEY, A.R. Southern University
MOORE, R.L.	SD50	ADAMS, J.H. SD50
GARY, G.A.	SD50	AHN, E.J. SD50
A Measure From Line-of-Sight Magnetograms for Prediction of Coronal Mass Ejections—Abstract Only. For publication in the Journal of Geophysical Research, 2003.		BASHINDZHAGYAN, G. SD50
		CASE, G. SD50
		CHANG, J. SD50
		CHRISTL, M.J. SD50
		ELLISON, S.B. SD50
FALCONER, D.A.	SD50	GANEL, O. SD50
MOORE, R.L.	SD50	GOULD, R. SD50
GARY, G.A.	SD50	Detection of High-Energy Cosmic Rays With the Advanced Thin Ionization Calorimeter, ATIC—Abstract Only. For

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(Publicly available. Dates are conference dates.)

presentation at the 31st Coral Gables Conference on High-Energy Physics and Cosmology, Fort Lauderdale, FL, December 11–15, 2002.

FAZLEY, A.R. Southern University
GUNASINGHA, R.M. Southern University
ADAMS, J.H. SD50
AHN, E.J. Seoul National University
AHN, H.S. University of Maryland
BASHINDZHAGYAN, G.L. Moscow State University
CASE, G. Louisiana State University
CHANG, J. Max Planck Institute
CHRISTL, M.J. SD50
ELLISON, S.B. Louisiana State University
Relative Abundances and Energy Spectra of C, N, and O as Measured by the Advanced Thin Ionization Calorimeter Balloon Experiment—Abstract Only. For presentation at the 28th International Cosmic Ray Conference, Tsukuba, Japan, July 31–August 7, 2003.

FENG, Y.X. SD50
TENNANT, A.F. SD50
ZHANG, S.N. SD50
Probing the Inflow/Outflow and Accretion Disk of Cyg X-1 in the High State With HETG/Chandra—Abstract Only. For publication in The Astrophysical Journal, 2003.

FERREE, D.S. SD46
MALONE, C.C. SD46
KARR, L.J. SD46
Nueregulin—First Steps Towards a Structure—Abstract Only. For presentation at the American Crystallographic Association Meeting, Covington, KY, July 26–31, 2003.

FIKES, J.C. FD02
HENLEY, M.W. FD02
MANKINS, J.C. FD02
HOWELL, J.T. FD02
FORK, R.L. FD02
COLE, S.T. FD02
SKINNER, M. FD02
Recent Accomplishments in Laser-Photovoltaic Wireless Power Transmission—Abstract Only. For presentation at the AMOS Technical Conference, Maui, HI, September 8–12, 2003.

FINCKENOR, M.M. ED31
VAUGHN, J.A. ED31
WATTS, E.W. Qualis Corporation
Changes in Polymeric Tether Properties Due to Atomic Oxygen—Abstract Only. For presentation at the 42nd AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 5–9, 2004.

FISHMAN, G.J. SD50
EXIST: The Next Large GRB Observatory—Abstract Only. For presentation at the EXIST Science Working Group Meeting, Mt. Termblant, PQ, Canada, March 23–26, 2003.

FISHMAN, G.J. SD50
Gamma-Ray Bursts—Abstract Only. For presentation at the IAU Colloquium 192, Valencia, Spain, April 22–26, 2003.

FISHMAN, G.J. SD50
BRIGGS, M.S. SD50
Gamma-Ray Burst Observations with BATSE—Abstract Only. For presentation at the COSPAR Scientific Assemblies & World Space Congress, Houston, TX, October 10–19, 2002.

FORK, R.L. UAH
CARRINGTON, C.K. FD02
WALKER, W.W. UAH
COLE, S.T. UAH
GREEN, J.A. UAH
LAYCOCK, R.L. UAH
Solar Pumped Solid State Lasers for Space Solar Power: Experimental Path—Abstract Only. For presentation at the 54th International Astronautical Congress, Bremen, Germany, September 29–October 3, 2003.

FRAZIER, D.O. SD01
Evolution of Local Microstructures of Clusters Undergoing Two-Dimensional Diffusion—Abstract Only. For presentation (Lecture) at CosmoCaixa, Madrid, Spain, March 26–28, 2003.

FRAZIER, D.O. SD01
ROGERS, J.R. SD46
WITHEROW, W.K. SD46
FACEMIRE, B.R. USRA
INGUVA, R. USRA
GLICKSMAN, M.E. Rensselaer Polytechnic Institute
Evolution of Local Microstructures: Spatial and Temporal Correlation in Clusters Undergoing Two-Dimensional Diffusion—Abstract Only. For presentation at the 41st AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 6–9, 2003.

FRIGO, S.P. Northern Arizona University
MCNULTY, I. Argonne National Laboratory
RICHMOND, R.C. SD46
EHRET, C.F. General Chronobionics
Photoabsorption Study of Bacillus Megaterium, DNA, and Related Biological Materials in the Phosphorus K-Edge

MSFC ABSTRACTS, ARTICLES, PAPERS, AND PRESENTATIONS CLEARED FOR DISSEMINATION
(Publicly available. Dates are conference dates.)

Region—Abstract Only. For publication in Radiation Research, 2003.		GASKIN, J.	SD50
		RICHARDSON, G.A.	SD50
		MITCHELL, S.	SD50
GALLAGHER, D.L.	SD50	SHARMA, D.	SD50
When Earth Songs Filled the Void of Space—Abstract Only. For presentation at the Tennessee Association of American Physics Teachers, Clarksville, TN, March 28, 2003.		RAMSEY, B.D.	SD50
		SELLER, P.	SD50
		Characterization of a 2-mm Thick, 16×16 Cadmium-Zinc-Telluride Pixel Array—Abstract Only. 13th International Workshop on Room-Temperature Semiconductor X- and Gamma-Ray Detectors, Portland, OR, October 19–25, 2003.	
GALLAGHER, D.L.	SD50		
ADRIAN, M.L.	SD50	GASKIN, J.	SD50
PEREZ, J.	SD50	SHARMA, D.	SD50
SANDEL, B.R.	SD50	RAMSEY, B.D.	SD50
IMAGE Observations of Plasmasphere/Ring Current Interactions—Abstract Only. For presentation at the International Union of Geodesy and Geophysics, Sapporo, Japan, June 30–July 11, 2003.		SELLER, P.	Rutherford Appleton Laboratory
		Characterization of Pixelated Cadmium-Zinc-Telluride Detectors for Astrophysical Applications—Abstract Only. For presentation at and publication in Proceedings of the Optics for EUV, X-Ray and Gamma-Ray Astronomy Conference, San Diego, CA, August 3–8, 2003.	
GAMWELL, W.R.	ED33	GASKIN, J.	SD50
MCGILL, P.B.	ED33	SHARMA, D.	SD50
The Cryogenic Properties of Several Aluminum-Beryllium Alloys and a Beryllium Oxide Material—Abstract Only. For presentation at the SPIE Optical Science and Technology 48th Annual Meeting, San Diego, CA, August 3–8, 2003.		RAMSEY, B.D.	SD50
		SELLER, P.	Rutherford Appleton Laboratory
		Charge Loss and Charge Sharing Measurements for Two Different Pixelated Cadmium-Zinc-Telluride Detectors—Abstract Only. For presentation at HEAD 2003 – Seventh Meeting of the AAS High-Energy Astrophysics Division, Mr. Tremblant, PQ, Canada, March 23–26, 2003.	
GARBE, G.P.	TD05		
MONTGOMERY, E.E., IV	TD05	GERRISH, H.P., JR.	TD40
An Overview of NASA's Solar Sail Propulsion Project—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Huntsville, AL, July 20–23, 2003.		Solar Thermal Propulsion Improvements at Marshall Space Flight Center—Abstract Only. For presentation at the Advanced Space Propulsion Workshop, Huntsville, AL, April 15–17, 2003.	
GARCIA, R.	TD64		
GRIFFIN, L.W.	TD64	GERRISH, H.P., JR.	TD40
WILLIAMS, R.W.	TD64	Solar Thermal Propulsion—Presentation. For presentation at the AIAA Space Propulsion Symposium, Cocoa Beach, FL, February 15, 2003.	
Overview of MSFC's Applied Fluid Dynamics Analysis Group Activities—Presentation. For presentation at the MSFC Spring Workshop on Fluids, Birmingham, AL, April 23–24, 2003, and for presentation at the MSFC Fall Workshop on Fluids, Huntsville, AL, November 19–21, 2002.			
GARY, G.A.	SD50	GEVEDEN, R.D.	DD01
Parametric Transformation Analysis—Abstract Only. For presentation at the AAS Solar Physics Division, Laurel, MD, June 16–20, 2003.		Marshall Space Flight Center Overview—Presentation. For presentation at the 6th Annual Space and Missile Defense Conference, Huntsville, AL, August 19–21, 2003.	
GARY, G.A.	SD50	GEVEDEN, R.	SD30
The NRC Research Associateship Program has Greatly Enhanced the Solar Research at Marshall Space Flight Center During the Last Quarter Century—Abstract Only. For publication in The RAP Sheet, 2003.		MAY, T.	SD31
		Gravity Probe B: Testing Einstein With Gyroscopes—Abstract Only. For presentation at and publication in Proceedings of AIAA Space Conference and Exposition, Long Beach, CA, September 23–25, 2003.	

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(Publicly available. Dates are conference dates.)

GILLIES, D.C.	SD40	GOODMAN, S.J.	SD60
CARPENTER, P.K.	SD40	Atmospheric Electrical Activity and the Prospects for	
ENGEL, H.P.	SD40	Improving Short-Term Weather Forecasting—Abstract	
The Mundrabilla Meteorite in Three-Dimensions—		Only. For presentation at the International Conference on	
Abstract Only. For presentation at the National Museum		Atmospheric Electricity, Versailles, France, June 9–13,	
of Natural History, Washington, DC, July 18, 2003.		2003.	
GLASGOW, S.	ED26	GOODMAN, S.J.	SD60
KITTREDGE, K.	ED26	BLAKESLEE, R.J.	SD60
Performance Testing of Thermal Interface Filler Materials		CHRISTIAN, H.J.	SD60
in a Bolted Aluminum Interface Under Thermal/Vacuum		KOSHAK, W.J.	SD60
Conditions—Final Paper. For presentation at the Thermal		BAILEY, J.C.	Raytheon
& Fluids Analysis Workshop, Hampton, VA, August 18–		HALL, J.M.	Global Hydrology & Climate Center
22, 2003.		MCCAUL, E.W., JR.	Global Hydrology & Climate Center
GODFROY, T.J.	TD40	BUECHLER, D.E.	National Weather Service
BRAGG-SITTON, S.M.	University of Michigan	DARDEN, C.	National Weather Service
VAN DYKE, M.V.	TD40	BURKS, J.	National Weather Service
Thermally Simulated Testing of a Direct-Drive Gas-		The North Alabama Lightning Mapping Array: Recent	
Cooled Nuclear Reactor—Final Paper. For presentation at		Results and Future Prospects—Abstract Only. For	
and publication in Proceedings of International Congress		presentation at the International Conference on Atmo-	
on Advances in Nuclear Power Plants, Cordoba, Spain,		spheric Electricity, Versailles, France, June 9–13, 2003.	
May 4–7, 2003.		GOODMAN, S.J.	SD60
GOGUS, E.	SD50	LAPENTA, W.M.	SD60
FINGER, M.H.	SD50	JEDLOVEC, G.	SD60
KOUVELITOU, C.	SD50	DODGE, J.	NASA Headquarters
WOODS, P.M.	SD50	BRADSHAW, T.	National Weather Service
PATEL, S.K.	SD50	The NASA Short-Term Prediction Research and Transition	
RUPEN, M.	SD50	(SPoRT) Center: A Collaborative Model for Accelerating	
SWANK, H.H.	SD50	Research Into Operations—Abstract Only. For presenta-	
MARKWARDT, C.B.	SD50	tion at the 20th Conference on Weather Analysis and	
VAN DER KLIS, M.	SD50	Forecasting, Seattle, WA, January 12–15, 2004.	
Long-Term Spectral and Timing Behavior of Black		GORTI, S.	SD46
Hole Candidate XTE J1908+094—Abstract Only. For		FORSYTHE, E.L.	USRA
publication in The Astrophysical Journal, 2003.		LAXSON, N.	USRA
GOLDEN, B.L.	Purdue University	PUSEY, M.L.	SD46
KUNDROT, C.E.	SD48	Critical Behavior at the L-L Phase of Lysozyme Protein	
RNA Crystallization—Abstract Only. For publication in		Solutions—Abstract Only. For publication in Science,	
the Journal of Structural Biology, 2003.		2003.	
GOLDSTEIN, J.	Rice University	GORTI, S.	SD46
SPASOJEVIC, M.	STAR Laboratory	FORSYTHE, E.L.	SD46
REIFF, P.	Rice University	PUSEY, M.L.	SD46
SANDEL, B.R.	University of Arizona	Kinetic Roughening and Energetics of Tetragonal	
FORRESTER, T.T.	University of Arizona	Lysozyme Crystal Growth—Abstract Only. For publication	
GALLAGHER, D.L.	SD50	in Crystal Growth & Design, 2003.	
REINISCH, B.W.	University of Massachusetts	GORTI, S.	SD46
Identifying the Plasmopause in IMAGE EUV Data Using		FORSYTHE, E.L.	USRA
IMAGE RPI In Situ Density Gradients—Abstract Only.		PUSEY, M.L.	SD46
For publication in the Journal of Geophysical Research,		Modeling Tetragonal Lysozyme Crystal Growth	
2003.		Rates—Abstract Only. For presentation at the American	

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Crystallographic Association Meeting, Covington, KY,
July 26–31, 2003.

Only. For presentation at the NASA MSFC Propulsion
Measurement Sensor Development Workshop, Huntsville,
AL, May 13–15, 2003.

GOSTOWSKI, R.	TD40		
Isothermal Calorimetric Observations of the Effect of Welding on Compatibility of Stainless Steels With High- Test Hydrogen Peroxide Propellant—Abstract Only. For presentation at the JANNAF/CS/APS/PSHS/MSS Joint Meeting, Colorado Springs, CO, December 1–5, 2003, and publication in <i>Thermochimica Acta</i> , 2003.			
GRANT, J.	SD72	GRAY, P.A.	ICRC
KAUL, R.K.	SD72	NEHLS, M.K.	ED31
MYERS, G.	SD72	EDWARDS, D.L.	ED31
SHARMA, A.		CARRUTH, M.R., JR.	ED31
Alabama A&M University		Survey of Beamed Energy Propulsion Concepts by the MSFC Space Environmental Effects Team—Final Paper. For presentation at the First International Symposium on Beamed Energy Propulsion, Huntsville, AL, Novem- ber 5–7, 2002.	
Investigation of Carbon-Polymer Structures With Embedded Fiber-Optic Bragg Gratings—Abstract Only. For presentation at and publication in <i>Proceedings of SPIE Optical Science and Technology 48th Annual Meeting</i> , San Diego, CA, August 3–8, 2003.		GREENE, W.D.	TD53
GRANT, J.	SD72	THAMES, M.P.	TD53
KAUL, R.K.	SD72	POLSGROVE, R.H.	TD51
TAYLOR, S.	SD72	Systems Modeling of a Hypothetical SSME Channel- Wall Nozzle—Abstract Only. For presentation at the 52nd JANNAF Propulsion Meeting/1st Liquid Propulsion Subcommittee Meeting, Las Vegas, NV, May 10–13, 2004.	
JACKSON, K.	SD72	GREINER, J.	Astrophysikalisches Inst.
MYERS, G.	SD72	KLOSE, S.	Thüringer Landesstern
SHARMA, A.		SALVATO, M.	Astrophysikalisches Inst.
Alabama A&M University		ZEH, A.	Thüringer Landesstern
Structural Health Monitoring of Composite Wound Pressure Vessels—Abstract Only. For presentation at and publication in <i>Proceedings of the SPIE Symposium on Smart Materials, Nano-, and Micro-Smart Systems</i> , Melbourne, Australia, December 15–18, 2002.		SCHWARTZ, R.	Astrophysikalisches Inst.
GRANT, J.	SD72	HARTMAN, D.H.	Clemson University
KAUL, R.K.	SD72	MASETTI, N.	Istituto di Astrofisica
TAYLOR, S.	SD72	STECKLUM, B.	Thüringer Landesstern
JACKSON, K.	SD72	LAMER, G.	Astrophysikalisches Inst.
OSEI, A.		KOUVELIOTOU, C.	SD50
SHARMA, A.		GRB 011121: A Collimated Outflow Into Wind-Blown Surroundings—Abstract Only. For publication in <i>The Astrophysical Journal</i> , 2003.	
Oakwood College		GRIFFIN, L.W.	TD64
Alabama A&M University		MSFC Turbomachinery Fluid Dynamics Roadmap— Presentation. For presentation at the MSFC Spring Workshop on Fluids, Birmingham, AL, April 22–24, 2003.	
Distributed Sensing of Carbon-Epoxy Composites and Filament Wound Pressure Vessels Using Fiber-Bragg Gratings—Abstract Only. For presentation at and pub- lication in <i>Proceedings of the SPIE Symposium on Smart Structures and Materials</i> , San Diego, CA, March 2–6, 2003.		GRIFFIN, L.W.	TD64
GRANT, J.	SD72	DORNEY, D.J.	TD64
KAUL, R.K.	SD72	HUBER, F.W.	Riverbend Design Serv.
TAYLOR, S.	SD72	Design and Analysis of Turbines for Space Applications— Final Paper. For presentation at the 33rd AIAA Fluid Dynamics Conference, Orlando, FL, June 23–26, 2003.	
MYERS, G.	SD72	GRUBBS, R.	MSFC
SHARMA, A.		HDTV From the <i>International Space Station</i> —Charts Only. For presentation at the University of South Florida Seminar, Tampa, FL, March 28, 2003.	
Alabama A&M University			
Investigation of Carbon-Polymer Structures With Embedded Fiber-Optic Bragg Gratings—Abstract			

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GRUGEL, R.N.	SD46	GUERRA, M.	University of Texas, El Paso
ANILKUMAR, A.V.	Vanderbilt University	SCHMIDT, C.	University of Texas, El Paso
LEE, C.P.	SD46	MCCLURE, J.C.	University of Texas, El Paso
Bubble Formation and Transport During Microgravity Materials Processing: Model Experiments on the <i>International Space Station</i> —Abstract Only. For presentation at the Microgravity Transport Processes in Fluid, Thermal, Biological, and Materials Sciences Conference III, Davos, Switzerland, September 14–19, 2003, and for presentation at and publication in Proceedings of the 42nd AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 5–8, 2004.		MURR, L.E.	University of Texas, El Paso
		NUNES, A.C., JR.	ED33
		Flow Patterns During Friction Stir Welding—Final Paper. For publication in Materials Characterization, 2002.	
		GUIDOS, M.	TD53
		SEYMOUR, D.	ERC, Inc./TD53
		Transient Simulation of the Integrated Powerhead Demonstrator (IPD) Rocket Engine—Abstract Only. For presentation at the 52nd JANNAF Propulsion Meeting/1st Liquid Propulsion Subcommittee Meeting, Las Vegas, NV, May 10–13, 2004.	
GRUGEL, R.N.	SD46		
ANILKUMAR, A.V.	Vanderbilt University		
LEE, C.P.	ESI		
Direct Observation of Controlled Melting and ReSolidification of Succinonitrile Mixtures in a Microgravity Environment—Abstract Only. For presentation at the 2004 TMS Annual Meeting, Charlotte, NC, March 14–18, 2004.		GUZIK, T.G.	Louisiana State University
		ADAMS, J.H.	SD50
		AHN, H.S.	University of Maryland
		BASHINDZHAGYAN, G.L.	Moscow State University
		CHANG, J.	Max Planck Institute
		CHRISTL, M.J.	SD50
		FAZLEY, A.R.	Southern University
		GANEL, O.	SD50
		GRANGER, D.	Louisiana State University
		GUNASINGHA, R.M.	Southern University
		The ATIC Long-Duration Balloon Project—Abstract Only. For presentation at and publication in Proceedings of the 34th COSPAR Scientific Assembly/World Space Congress, Houston, TX, October 10–19, 2002, and for publication in Advances in Space Research, 2003.	
GRUGEL, R.N.	SD46		
ANILKUMAR, A.V.	SD46		
LEE, C.P.	SD46		
Pore Formation and Mobility Investigation (PFMI): Description and Initial Analysis of Experiments Conducted Aboard the <i>International Space Station</i> —Abstract Only. For presentation at the International Symposium on Physical Sciences in Space, Toronto, ON Canada, May 4–8, 2003, and for presentation at the Fifteenth American Conference on Crystal Growth and Epitaxy, Keystone, CO, July 20–24, 2003.		GWALTNEY, D.A.	ED17
		FERGUSON, M.I.	Jet Propulsion Laboratory
		Hardware Evolution of Analog Speed Controllers for a DC Motor—Final Paper. For presentation at the NASA/DoD Conference on Evolvable Hardware, Chicago, IL, July 9–11, 2003.	
GUBAREV, M.	USRA		
RAMSEY, B.D.	SD50		
APPLE, J.	SD50		
Gas Scintillation Proportional Counters for High-Energy X-Ray Astronomy—Abstract Only. For presentation at and publication in Proceedings of the Optics for EUV, X-Ray, and Gamma-Ray Astronomy Conference, San Diego, CA, August 3–8, 2003.		GWALTNEY, D.A.	ED17
		FERGUSON, M.I.	Jet Propulsion Laboratory
		Hardware Evolution of Analog Speed Controllers for a DC Motor—Presentation. For presentation at the Genetic and Evolutionary Computation Conference, Chicago, IL, July 12–16, 2003.	
GUBAREV, M.	USRA		
RAMSEY, B.D.	SD50		
KESTER, T.	SD70		
ENGELHAUPT, D.	UAH		
SPEEGLE, C.O.	Raytheon ITSS		
MARTIN, G.	ERC, Inc.		
Figure Measurements of High-Energy-X-Ray Replicated Optics—Abstract Only. For presentation at and publication in Proceedings of the Optics for EUV, X-Ray, and Gamma-Ray Astronomy Conference, San Diego, CA, August 3–8, 2003.		GWALTNEY, D.A.	ED17
		FERGUSON, M.I.	ED17
		Intrinsic Hardware Evolution for the Design and Reconfiguration of Analog Speed Controllers for a DC Motor—Presentation and Final Paper. For presentation at the 2003 NASA/DoD Conference on Evolvable Hardware, Chicago, IL, July 9–11, 2003.	

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GWALTNEY, D.A.	ED17	The Burst and Transient Source Experiment (BATSE)
STEINCAMP, J.	ED17	Earth Occultation Catalog of Low-Energy Gamma-Ray Sources—Abstract Only. For publication in The Astrophysical Journal, 2003.
CORDER, E.	ED17	
KING, K.	ED17	
FERGUSON, M.I.		Jet Propulsion Laboratory
DUTTON, K.		Madison Research Corporation
		Hardware Evolution of Control Electronics—Poster. For presentation at the NASA/DoD Conference on Evolvable Hardware, Chicago, IL, July 9–11, 2003.
HAGYARD, M.J.	SD50	
PEVTSOV, A.A.		National Solar Observatory
BLEHM, Z.		Montana State University
SMITH, J.E.	SD50	
		Observed Helicity of Active Regions in Solar Cycle 21—Abstract Only. For presentation at the AAS Solar Physics Division Annual Meeting, Laurel, MD, June 16–20, 2003; and for publication in The Astrophysical Journal Letters, 2003.
HAGYARD, M.J.	SD50	
PEVTSOV, A.A.		National Solar Observatory
CANFIELD, R.C.		Montana State University
BLEHM, Z.		Montana State University
SMITH, J.E.	SD50	
		Observed Helicity of Active Region Magnetic Fields in Solar Cycle 21—Abstract Only. For publication in Solar Physics, 2003, and in the Solar Journal, 2003.
HAKKILA, J.		College of Charleston
GIBLIN, T.W.		College of Charleston
ROIGER, R.J.		Mankato State University
HAGLIN, D.J.		Mankato State University
PACIESAS, W.S.	UAH	
MEEGAN, C.A.	SD50	
		How Sample Completeness Affects Gamma-Ray Burst Classification—Abstract Only. For publication in The Astrophysical Journal, 2002.
HANSON, J.M.	TD54	
		A Plan for Advanced Guidance and Control Technology for 2nd-Generation Reusable Launch Vehicles—Final Paper. For publication in Aerospace America, 2002.
HARMON, B.A.	SD50	
WILSON, C.A.	SD50	
FISHMAN, G.J.	SD50	
CONNAUGHTON, V.	UAH	
HENZE, W.	UAH	
PACIESAS, W.S.	UAH	
FINGER, M.H.	SD50	
MCCOLLOUGH, M.L.	SD50	
SAHI, M.	SD50	
ET AL.		
HARRIS, D.	TD05	
BILLE, M.		Booz Allen Hamilton
REED, L.		Booz Allen Hamilton
		Future Space Transportation Technology: Prospects and Priorities—Final Paper. For presentation at the AIAA Space Conference and Exposition, Long Beach, CA, September 23–25, 2003.
HASSAN, N.		Virginia Polytechnic Institute
SONG, X.		Virginia Polytechnic Institute
THOMPSON, J.E.		Virginia Polytechnic Institute
LOOS, A.C.		Virginia Polytechnic Institute
BATRA, R.C.		Virginia Polytechnic Institute
HULCHER, A.B.	ED34	
		A Three-Dimensional Heat Transfer Model of a Thermoset Fiber Placement Composite Manufacturing Process—Final Paper. For presentation at the SAMPE International Symposium & Exhibition, Long Beach, CA, May 11–15, 2003.
HATHAWAY, D.H.	SD50	
		Large-Scale Flows Through the Solar Cycle—Abstract Only. For presentation at and publication in Proceedings of the SOHO 12 GONG+ Conference “Local and Global Helioseismology: The Present and Future,” Big Bear Lake, CA, October 27–November 1, 2002.
HATHAWAY, D.H.	SD50	
NANDY, D.	SD50	
WILSON, R.M.	SD50	
REICHMAN, E.J.	SD50	
		Evidence That A Deep Meridional Flow Sets The Sunspot Cycle Period—Abstract Only. For presentation at the AAS Solar Physics Division Annual Meeting, Laurel, MD, June 16–20, 2003, and for publication in The Astrophysical Journal, 2003.
HEDAYAT, A.	TD52	
BAILEY, J.W.		Sverdrup
HASTINGS, L.J.		Alpha Technology, Inc.
FLACHBART, R.H.	TD52	
		Test Data Analysis of a Spray Bar Zero Gravity Liquid Hydrogen Vent System for Upper Stages—Final Paper. For presentation at the Advances in Cryogenic Engineering, Transactions of the International Cryogenic Materials Conference, Anchorage, AK, September 22–26, 2003.
HEDAYAT, A.	TD52	
BAILEY, J.W.		Sverdrup

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HASTINGS, L.J.	Alpha Technology, Inc.	GREINER, J.	SD50
FLACHBART, R.H.	TD52	ANDERSON, M.I.	SD50
HOLT, K.A.	TD52	CASTRO-TIRADO, A.	SD50
Thermodynamic Venting System Modeling and Comparison With Liquid Hydrogen Test Data—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23 2003.		A Very Energetic Supernova Associated With the Gamma Ray Burst of 29 March 2003—Abstract Only. For publication in Nature, 2003.	
HENLEY, M.W.	Boeing	HOFFMAN, F.	Oak Ridge National Laboratory
FIKES, J.C.	FD02	OGLESBY, R.J.	SD60
HOWELL, J.T.	FD02	HARGROVE, W.W.	Oak Ridge National Laboratory
MANKINS, J.C.	NASA Headquarters	ERICKSON, D.	Oak Ridge National Laboratory
Space Solar Power Technology Demonstration for Lunar Polar Applications: Laser-Photovoltaic Wireless Power Transmission—Paper and Presentation. For presentation at the 54th International Astronautical Congress, Bremen, Germany, October 10–19, 2002.		Using Clustering to Establish Climate Regimes From PCM Output—Abstract Only. For presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 6–10, 2002.	
HENLEY, M.W.	Boeing	HOLDER, D.	FD21
POTTER, S.	Boeing	HUTCHENS, C.	FD21
HOWELL, J.T.	FD02	Development Status of the <i>International Space Station</i> Urine Processor Assembly—Final Paper. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–11, 2003.	
MANKINS, J.C.	NASA Headquarters	HOLLADAY, J.	FD23
Wireless Power Transmission Options for Space Solar Power—Paper and Presentation. For presentation at the 53rd International Astronautical Congress, The World Space Congress—2002, Houston, TX, October 10–19, 2002.		CHO, F.	Johnson Space Center
HILLMAN, L.W.	UAH	The <i>International Space Station's</i> Multi-Purpose Logistics Module, Thermal Performance of the First Five Flights—Abstract Only. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.	
TAKAHASHI, Y.	UAH	HOLLADAY, J.	FD23
ZUCCARO, A.	UAH	DAY, G.	Boeing
LAMB, D.	UAH	ROBERTS, B.C.	ED44
PITALO, K.	UAH	LEAHY, F.	Raytheon
LOPADO, A.	UAH	An Integrated Approach to Thermal Management of <i>International Space Station</i> Logistics Flights, Improving the Efficiency—Abstract Only. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.	
KEYS, A.S.	SD72	HOLMES, A.M.	UAH
Wide-Angle Optical Telescope for the EUSO Experiments—Abstract Only. For presentation at the 28th International Cosmic Ray Conference, Tsukuba, Japan, July 31–August 7, 2003.		MONACO, L.	Morgan Research
HISSAM, S.A.	TD62	BARNES, C.L.	USRA
BOWER, M.	UAH	SPEARING, S.	Morgan Research
Analysis of a Preloaded Bolted Joint in a Ceramic Composite Combustor—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		JENKINS, A.	Morgan Research
HJORTH, J.	SD50	JOHNSON, T.	Micro Craft
SOLLERMAN, J.	SD50	MAYER, D.	ASRI
MOLLER, P.	SD50	COLE, H.E.	SD44
FYNBO, J.P.U.	SD50	Science Issues Associated With the Use of a Microfluidic Chip Designed Specifically for Protein Crystallization—Abstract Only. For presentation at the American Crystallographic Association Meeting, Covington, KY, July 26–31, 2003.	
WOOSLEY, S.E.	SD50		
KOUVELITOU, C.	SD50		
TANVIR, N.R.	SD50		

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HOLMES, A.M.	SD46	HOWARD, R.T.	ED19
WITHEROW, W.K.	SD46	BRYAN, T.C.	ED19
CHEN, L.Q.	UAH	BOOK, M.L.	ED19
CHERNOV, A.A.	USRA	JOHNSTON, A.S.	ED19
Elasticity and Strength of Biomacromolecular Crystals— Lysozyme—Abstract Only. For publication in Physical Review Letters, 2003.		Advanced Video Guidance Sensor Development Testing— Abstract Only. For presentation at the SPIE Defense and Security Symposium, Orlando, FL, April 13–15, 2004.	
HOOVER, R.B.	SD50	HOWELL, J.T.	FD02
PIKUTA, E.V.	UAH	MANKINS, J.C.	NASA Headquarters
BEJ, A.K.	UAB	Transformational Concepts and Technologies for the Exploration and Development of Space—Abstract Only.	
MARSIC, D.	UAH	For presentation at the 54th International Astronautical Congress, Bremen, Germany, September 29–October 3, 2003.	
WHITMAN, W.B.	University of Georgia		
TANG, J.	American Type Culture		
KRADER, P.	American Type Culture		
Spirochaeta Americana Sp. Nov., A New Haloalkaliphilic, Obligately Anaerobic Spirochete Isolated From Soda Mono Lake in California—Abstract Only. For publication in the International Journal of Systematic and Evolutionary Microbiology, 2002.		HOWELL, L.W., JR.	SD50
		Statistical Properties of Maximum Likelihood Estimators of Power Law Spectra Information—Abstract Only. For publication in the Nuclear Instruments and Methods-A Journal, 2003.	
HOUTS, M.	TD40	HUANG, X.	University of Massachusetts
VAN DYKE, M.V.	TD40	REINISCH, B.W.	University of Massachusetts
GODFROY, T.J.	TD40	SONG, P.	University of Massachusetts
MARTIN, J.J.	TD40	NSUMEI, P.	University of Massachusetts
BRAGG-SITTON, S.M.	TD40	GREEN, J.L.	Goddard Space Flight Center
DICKENS, R.	Micro Craft, Inc.	GALLAGHER, D.L.	SD50
SALVAIL, P.	Morgan Research	Empirical Model of the Plasma Density in the Inner Magnetosphere—Abstract Only. For presentation at the COSPAR Scientific Assemblies & World Space Congress, Advances for Space Research, Houston, TX, October 10– 19, 2002.	
WILLIAMS, E.	LB&B Associates		
HRBUD, I.	ERC, Inc.		
ET AL.		HUBER, F.W.	TD64
Hardware-Based Technology Assessment in Support of Near-Term Space Fission Missions—Final Paper. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.		GRIFFIN, L.W.	TD64
		SIMPSON, S.P.	TD64
HOVATER, M.A.	ED31	Turbine Aerodynamic Design System Improvements— Presentation. For presentation at the MSFC Spring Workshop on Fluids, Birmingham, AL, April 22–24, 2003.	
SCHNEIDER, T.	ED31		
VAUGHN, J.A.	ED31		
CARRUTH, M.R., JR.	ED31		
JONGEWARD, G.A.	ED31		
MIKELLIDES, I.G.	ED31	HUETER, U.	TD15
Plasma Interactions With High-Voltage Solar Arrays for a Direct Drive Hall Effect Thruster System—Abstract Only. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		NASA's Next-Generation Launch Technology Program— Strategy and Plans—Final Paper. For presentation at the 54th International Astronautical Congress, Bremen, Germany, September 29–October 3, 2003.	

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IRWIN, D.	SD60	Aerocapture Technology Project Overview—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.
A Regional Monitoring and Visualization System for Decision Support and Disaster Management Applications for the Mesoamerican Biological Corridor and Beyond—Abstract Only. For presentation at the Central American Commission for Environment and Development Donors Conference, Paris, France, December 12, 2002.		
JAAP, J.	FD42	
DAVIS, E.	FD42	
Enabling a New Planning and Scheduling Paradigm—Abstract Only. For presentation at the SpaceOps 2004, Montreal, PQ, Canada, May 17–21, 2004.		
JAAP, J.	FD42	
RICHARDSON, L.	FD42	
DAVIS, E.	FD42	
Maximally Expressive Modeling of Operations Tasks—Final Paper. For presentation at the IEEE Aerospace Conference, Big Sky, MT, March 7–15, 2003.		
JACOBY, M.T.	Schafer Corporation	
GOODMAN, W.A.	Schafer Corporation	
STAHL, H.P.	SD70	
KEYS, A.S.	SD72	
REILY, J.C.	SD74	
ENG, R.	SD73	
HADAWAY, J.B.	UAH	
HOGUE, W.D.	ED74	
KEGLEY, J.R.	ED74	
ET AL.		
Helium Cryo Testing of a SLMS (Silicon Lightweight Mirrors) Athermal Optical Assembly—Abstract Only. For presentation at and publication in Proceedings of SPIE Optical Science and Technology 48th Annual Meeting, San Diego, CA, August 3–8, 2003.		
JAKOBSSON, P.	University of Copenhagen	
HJORTH, J.	University of Copenhagen	
RAMIREZ-RUIZ, R.	University of Cambridge	
KOUVELIOTOU, C.	NSSTC/SD50	
PEDERSEN, K.	University of Copenhagen	
FYNBO, J.P.U.	University of Copenhagen	
GOROSABEL, J.	IAA-CSIC	
WATSON, D.	University of Copenhagen	
ET AL.		
Evidence for Filamentary Jet Structure: The Light Curve of GRB 011211—Abstract Only. For publication in The Astrophysical Journal, 2003.		
JAMES, B.	TD05	
MUNK, M.	TD05	
MOON, S.	Gray Research, Inc.	
JAMES, B.	TD15	
MUNK, M.	TD15	
MOON, S.	Gray Research, Inc.	
NASA Development of Aerocapture Technologies—Abstract Only. For presentation at the 17th AIAA Aerodynamic Decelerator Systems Technology Conference, Monterey, CA, May 19–22, 2003.		
JEDLOVEC, G.	SD60	
HAINES, S.	UAH	
SUGGS, R.M.	SD60	
BRADSHAW, T.	National Weather Service	
DARDEN, C.	National Weather Service	
BURKS, J.	National Weather Service	
Use of EOS Data in AWIPS for Weather Forecasting—Abstract Only. For presentation at the 20th Conference on Weather Analysis and Forecasting, Seattle, WA, January 12–15, 2004.		
JOHNSON, D.L.	ED44	
ROBERTS, B.C.	ED44	
VAUGHAN, W.W.	UAH	
Reference and Standard Atmosphere Models—Final Paper. For presentation at the 10th Conference on Aviation, Range, and Aerospace Meteorology, Portland, OR, May 13–16, 2002.		
JOHNSON, D.L.	ED44	
ROBERTS, B.C.	ED44	
VAUGHAN, W.W.	UAH	
JUSTUS, C.G.	CSC	
Atmospheric Models for Engineering Applications—Final Paper. For presentation at the 41st AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 6–9, 2003.		
JOHNSON, L.	TD05	
Exploring the Solar System—Presentation. For presentation at the National Space Society Meeting at the Madison County Library, Monroe Street, Huntsville, AL, June 5, 2003, and at the LibertyCon Science Fiction Convention, Chattanooga, TN, July 25–27, 2003.		
JOHNSON, L.	TD05	
NASA's In Space Propulsion Program—Final Paper. For presentation at the 9th International Workshop on Combustion and Propulsion, La Sapezia, Italy, September 21–25, 2003.		

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JOHNSON, L.	TD05	KAUFFMAN, B.	ED03
GILCHRIST, B.E.	University of Michigan	HARDAGE, D.	ED03
LORENZINI, E.C.	Harvard-Smithsonian	MINOR, J.	ED03
STONE, N.	SRS Technologies	Overview of NASA's Space Environments & Effects (SEE) Program Technology Development Activities—Abstract Only. For presentation at the Advanced Research Workshop on the Effects of Space Weather on Technology Infrastructure, Rhodes, Greece, March 23–30, 2003.	
WRIGHT, K.H., JR.	SD50	KAUFFMAN, B.	ED03
Propulsive Small Expendable Deployer System (ProSEDS) Experiment: Mission Overview and Status—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		HARDAGE, D.	ED03
JOY, M.	SD50	MINOR, J.	ED03
LAROQUE, S.J.	SD50	BARTH, J.	ED03
BONAMENTE, M.	SD50	LABEL, K.	ED03
CARLSTROM, J.E.	SD50	NASA'S Space Environments and Effects (SEE) Program—Presentation. For presentation at the AIAA/ICAS International Air and Space Symposium, Dayton, OH, July 14–17, 2003.	
DAWSON, K.S.	SD50	KAUFFMAN, B.	ED03
Cluster Masses Derived From X-Ray and Sunyaev-Zeldovich Effect Measurements—Abstract Only. For presentation at the HEAD 2003 – Seventh Meeting of the AAS High-Energy Astrophysics Division, Mt. Tremblant, PQ, Canada, March 23–26, 2003.		HARDAGE, D.	ED03
JUSTUS, C.G.	Computer Sciences Corporation	MINOR, J.	Goddard Space Flight Center
DUVALL, A.	Computer Sciences Corporation	BARTH, J.	Goddard Space Flight Center
JOHNSON, D.L.	ED44	LABEL, K.	Goddard Space Flight Center
Engineering-Level Model Atmospheres for Titan and Neptune—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		Technology Development Activities for the Space Environment and Its Effects on Spacecraft—Final Paper. For presentation at the AIAA/ICAS International Air & Space Symposium, Dayton, OH, July 14–18, 2003.	
JUSTUS, C.G.	Computer Sciences Corporation	KAUL, R.K.	ED34
DUVALL, A.	Computer Sciences Corporation	BARGHOUTY, A.F.	ED34
JOHNSON, D.L.	ED44	DAHCHÉ, H.M.	ED34
Mars Global Reference Atmospheric Model (Mars-GRAM) and Database for Mission Design—Extended Abstract. For presentation at the Mars Atmosphere Modeling and Observations, Granada, Spain, January 13–15, 2003.		Radiation Transport Properties of Polyethylene-Fiber Composites—Abstract Only. For presentation at the Microgravity Transport Processes in Fluid, Thermal, Biological, and Materials Sciences Conference III, Davos, Switzerland, September 14–19, 2003.	
JUSTUS, C.G.	Computer Sciences Corporation	KEARNEY, M.W., III	FD40
KELLER, V.	ED44	Future Concept for Realtime Data Interfaces for Control Centers—Abstract Only. For presentation at the SpaceOps 2004, Montreal, PQ, Canada, May 17–21, 2004.	
Engineering-Level Model Atmospheres for Titan and Mars—Abstract Only. For presentation at the International Workshop on Planetary Probe Atmospheric Entry and Descent Trajectory Analysis and Science, Lisbon, Portugal, October 6–9, 2003.		KELTON, K.F.	SD46
KAMMASH, T.	University of Michigan	GANGOPADHYAY, A.K.	SD46
MARTIN, J.J.	TD40	LEE, G.W.	SD46
GODFROY, T.J.	TD40	HYERS, R.W.	SD46
Antimatter-Driven P-Boron 11 Fusion Propulsion System—Final Paper. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.		RATHZ, T.J.	SD46
		ROGERS, J.R.	SD46
		ROBINSON, M.B.	SD46
		ET AL.	
		The Connection Between Local Icosahedral Order in Metallic Liquids and the Nucleation of Ordered Phases—Abstract Only. For publication in Physical Review Letters, 2003; Science Magazine, 2002/2003; and in Nature, 2002.	

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|---|---------------------------------|--|
| KEPHART, R. | UAH | Magnetic Storm, May 1–7, 1998—Abstract Only. For publication in <i>Nonlinear Processes in Geophysics</i> , 2003. |
| JUDGE, R.A. | UAH | |
| SNELL, E.H. | SD46 | |
| VAN DER WOERD, M.J. | SD46 | |
| Crystal Growth Rate Dispersion: A Predictor of Crystal Quality in Microgravity?—Abstract Only. For presentation at the American Crystallographic Association Meeting, Covington, KY, July 26–31, 2003. | | |
| KEYS, A.S. | SD72 | |
| CROW, R.W. | Sensing Strategies, Inc. | |
| ASHLEY, P.R. | U.S. Army Aviation | |
| Binary-Phase Fourier Gratings for Nonuniform Array Generation—Abstract Only. For presentation at and publication in <i>Proceedings of SPIE Optical Science and Technology 48th Annual Meeting</i> , San Diego, CA, August 3–8, 2003. | | |
| KHAZANOV, G.V. | SD50 | |
| Ring Current Ion Coupling With Electromagnetic Ion Cyclotron Waves—Abstract Only. For presentation at the Advanced Research Workshop on the Effects of Space Weather on Technology Infrastructure, Rhodes, Greece, March 23–30, 2003. | | |
| KHAZANOV, G.V. | SD50 | |
| DELAMERE, P.A. | University of Colorado | |
| KABIN, K. | University of Alberta | |
| LINDE, T.J. | University of Chicago | |
| KRIVORUTSKY, E. | UAH | |
| Fundamentals of the Plasma Sail Concept: MHD and Kinetic Studies—Abstract Only. For presentation at and publication in <i>Proceedings of the 41st AIAA Aerospace Sciences Meeting and Exhibit</i> , Reno, NV, January 6–9, 2003. | | |
| KHAZANOV, G.V. | SD50 | |
| GAMAYUNOV, K.V. | University of Alaska, Fairbanks | |
| JORDANOVA, V.K. | University of New Hampshire | |
| Self-Consistent Model of Magnetospheric Ring Current and Electromagnetic Ion Cyclotron Waves: The May 2–7, 1998, Storm—Abstract Only. For publication in the <i>Journal of Geophysical Research</i> , 2003. | | |
| KHAZANOV, G.V. | SD50 | |
| KABIN, K. | SD50 | |
| DELAMERE, P.A. | SD50 | |
| Fundamentals of Plasma Sails Propulsion Concept—Abstract Only. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003. | | |
| KHAZANOV, G.V. | SD50 | |
| KRIVORUTSKY, E. | SD50 | |
| GAMAYUNOV, K.V. | SD50 | |
| AVANOV, L.A. | SD50 | |
| The Nonlinear Coupling of Electromagnetic Ion Cyclotron and Lower Hybrid Waves in the Ring Current Region: The | | |
| Magnetic Storm, May 1–7, 1998—Abstract Only. For publication in <i>Nonlinear Processes in Geophysics</i> , 2003. | | |
| KHAZANOV, G.V. | SD50 | |
| LIEMOHN, M.W. | University of Michigan | |
| NEWMAN, T.S. | UAH | |
| FOK, M.-C. | Goddard Space Flight Center | |
| RIDLEY, A.J. | University of Michigan | |
| Magnetospheric Convection Electric Field Dynamics and Stormtime Particle Energization: Case Study of the Magnetic Storm of May 4, 1998—Abstract Only. For publication in <i>Anuales Geophysical</i> , 2003. | | |
| KHAZANOV, G.V. | SD50 | |
| LIEMOHN, M.W. | University of Michigan | |
| NEWMAN, T.S. | UAH | |
| FOK, M.-C. | Goddard Space Flight Center | |
| RIDLEY, A.J. | University of Michigan | |
| Stormtime Particle Energization With AMIE Potentials—Abstract Only. For presentation at and publication in <i>Proceedings of the American Geophysical Union Fall Meeting</i> , San Francisco, CA, December 8–12, 2003. | | |
| KHAZANOV, G.V. | SD50 | |
| SINGH, N. | UAH | |
| KRIVORUTSKY, E. | UAH | |
| The Nonlinear Coupling of Alfvén and Lower Hybrid Waves in Space Plasma—Abstract Only. For presentation at the Fifth International Meeting on Nonlinear Waves & Chaos in Space Plasmas, Mumbai, India, March 2–7, 2003. | | |
| KOCZOR, R.J. | SD01 | |
| Just Being on the Internet is Old News!—Abstract Only. For presentation at the Fall Meeting of the ADP Council of the Southeastern States, Biloxi, MS, October 22–24, 2003. | | |
| KOELBL, T.G. | ED13 | |
| PONCHAK, D. | GRG | |
| LAMARCHE, T. | Rannoch Corporation | |
| Digital Avionics—Abstract Only. For publication in <i>AIAA Aerospace America</i> , December 2003. | | |
| KOELFGEN, S.J. | UAH | |
| HAWK, C.W. | UAH | |
| ESKRIDGE, R. | TD40 | |
| SMITH, J.W. | TD40 | |
| MARTIN, A.K. | TD40 | |
| A Plasmoid Thruster for Space Propulsion—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Huntsville, AL, July 20–23, 2003. | | |
| KOROTEEV, A.S. | Keldysh Research Center | |
| PONOMAREV-STEPNOI, N.N. | Russian Research Center | |
| SMETANNIKOV, V.P. | State Enterprise | |
| GAFAROV, A.A. | Keldysh Research Center | |

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HOUTS, M.	TD40	LYUBARSKY, Y.	USRA
VAN DYKE, M.V.	TD40	PATEL, S.K.	SD50
GODFROY, T.J.	TD40	GOGUS, E.	USRA/Sabanci University
MARTIN, J.J.	TD40	VAN DER KLIS, M.	University of Amsterdam
BRAGG-SITTON, S.M.	TD40	TENNANT, A.F.	SD50
ET AL.		WACHTER, S.	SIRTF Science Center/Caltech
The Case of Nuclear Propulsion—Final Paper. For presentation at the AIAA/ICES International Air and Space Symposium, Dayton, OH, July 14–17, 2003.		Unraveling the Cooling Trend of the Soft Gamma Repeater, SGR 1627-41—Abstract Only. For publication in The Astrophysical Journal Letters, 2003.	
KOSHAK, W.J.	SD60	KOUVELIOTOU, C.	SD50
Analytic Solution to the Problem of Aircraft Electric Field Mill Calibration—Abstract Only. For presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 8–12, 2003.		PATEL, S.K.	SD50
		TENNANT, A.F.	SD50
		WOODS, P.M.	SD50
		FINGER, M.H.	SD50
		WACHTER, S.	SD50
KOSHAK, W.J.	SD60	IGR J16358-4726—Abstract Only. For publication in IAUC 8109, 2003.	
Mathematical Inversion of Lightning Data: Techniques & Applications—Abstract Only. For presentation at the University of Nevada, Las Vegas, NV, February 6, 2003.		KUNDROT, C.E.	SD40
		RNA Crystallization—Abstract Only. For publication in the Journal of Structural Biology.2003.	
KOSHAK, W.J.	SD60		
SOLAKIEWICZ, R.J.		Chicago State University	
BLAKESLEE, R.J.	SD60	KUNDROT, C.E.	SD40
GOODMAN, S.J.	SD60	Which Strategy for a Protein Crystallization Project?—Abstract Only. For publication in Cellular and Molecular Life Sciences, 2003.	
CHRISTIAN, H.J.	SD60		
HALL, J.M.	SD60	LAM, N.	Louisiana State University
BAILEY, J.C.	SD60	EMERSON, C.	Western Michigan University
KRIDER, E.P.	SD60	QUATTROCHI, D.A.	SD60
BATEMAN, M.G.	SD60	For publication in LandMines, Chapter—Fractals and Spatial Methods for Mining Remote Sensing Imagery, Kluwer Academic Publishers, The Netherlands, 2003.	
BOCCIPPIO, D.J.	SD60		
Error Analyses of the North Alabama Lightning Mapping Array (LMA)—Abstract Only. For presentation at the International Conference on Atmospheric Electricity, Versailles, France, June 9–13, 2003.		LAMONTIA, M.A.	Accudyne Systems, Inc.
KOSHAK, W.J.	SD60	GRUBER, M.B.	Accudyne Systems, Inc.
SOLAKIEWICZ, R.J.	SD60	FUNCK, S.B.	Accudyne Systems, Inc.
BLAKESLEE, R.J.	SD60	WAIBEL, B.J.	Accudyne Systems, Inc.
GOODMAN, S.J.	SD60	COPE, R.D.	Accudyne Systems, Inc.
CHRISTIAN, H.J.	SD60	HULCHER, A.B.	ED34
HALL, J.M.	SD60	Developing a Contoured Deposition Head for In Situ Tape Laying and Fiber Placement—Final Paper. For presentation at the SAMPE International Symposium & Exhibition, Long Beach, CA, May 11–15, 2003.	
BAILEY, J.C.	SD60		
KRIDER, E.P.	SD60	LAPENTA, W.M.	SD60
BATEMAN, M.G.	SD60	WOHLMAN, R.	UAH
ET AL.		BRADSHAW, T.	National Weather Service
North Alabama Lightning Mapping Array (LMA): VHF Source Retrieval Algorithm and Error Analyses—Abstract Only. For publication in the Journal of Atmospheric and Oceanic Technology, 2003.		BURKS, J.	National Weather Service
		JEDLOVEC, G.	SD60
KOUVELIOTOU, C.	SD50	GOODMAN, S.J.	SD60
EICHLER, D.		DARDEN, C.	National Weather Service
WOODS, P.M.	USRA	MEYER, P.	SD60

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Transition From Research to Operations: Assessing Value of Experimental Forecast Products Within the NWSFO Environment—Abstract Only. For presentation at the 20th Conference on Weather Analysis and Forecasting, Seattle, WA, January 12–15, 2004.		LEE, J.A.	ED33
		Cast Aluminum Alloy for High-Temperature Applications—Abstract Only. For presentation at the TMS 132nd Annual Meeting and Exhibition, San Diego, CA, March 2–6, 2003.	
LAROQUE, S.J.	SD50	LEE, J.K.	UAH
JOY, M.	SD50	GARY, G.A.	SD50
CARLSTROM, J.E.	SD50	NEWMAN, T.S.	UAH
EBELING, H.	SD50	Automated Corneal Loop Identification Using Digital Image Processing Techniques—Abstract Only. For presentation at the AAS Solar Physics Division, Laurel, MD, June 16–20, 2003.	
BONAMENTE, M.	SD50		
DAWSON, K.S.	SD50		
EDGE, A.	SD50		
HOLZAPFEL, W.L.	SD50		
PATEL, S.K.	SD50	LEIMKUEHLER, T.O.	Honeywell, Inc.
ET AL.		LUKENS, C.	Honeywell, Inc.
Sunyaev-Zeldovich Effect Imaging of MACS Galaxy Clusters at $z > 0.5$ —Abstract Only. For publication in The Astrophysical Journal, 2002.		REEVES, D.R.	Boeing
		HOLT, J.M.	ED25
		Operational Experience With the Internal Thermal Control System Dual-Membrane Gas Trap—Final Paper. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.	
LASZAR, J.	TD62	LEIMKUEHLER, T.O.	Honeywell, Inc.
MC-1 Engine Valves, Lessons Learned—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		SPELBRING, C.	Honeywell, Inc.
		REEVES, D.R.	Boeing
LASZAR, J.	TD62	HOLT, J.M.	ED25
SHAH, S.	ED33	Development of the Next-Generation Gas Trap for the Space Station Internal Thermal Control System—Final Paper. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.	
KASHALIKAR, U.	Foster-Miller, Inc.		
ROZENoyer, B.	Foster-Miller, Inc.		
The Application of Metal Matrix Composite Materials in Propulsion System Valves—Abstract Only. For presentation at the 52nd JANNAF Propulsion Meeting/1st Liquid Propulsion Subcommittee Meeting, Las Vegas, NV, May 10–13, 2004.			
		LESLIE, F.W.	SD46
LAW, B.C.	Mississippi State University	RAMACHANDRAN, N.	BAE Systems
HUDSON, S.T.	Mississippi State University	Solutal Convection in a Magnetic Fluid—Abstract Only. For publication in the Journal of Fluid Mechanics, 2003.	
STEELE, W.G.	Mississippi State University		
BUZZELL, J.C.	TD51	LEVIN, G.V.	Spherix, Inc.
HUGHES, M.S.	Stennis Space Center	MILLER, J.D.	University of Southern California
Parametric Uncertainty Analysis Study to Provide RBCC Testing Guidelines—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		STRAAT, P.A.	Retired
		HOOVER, R.B.	SD50
		A Sterile Robotic Mars Soil Analyzer—Abstract Only. For presentation at and publication in Proceedings of Instruments, Methods, and Missions for Astrobiology V, Waikoloa, HI, August 22–23, 2002.	
LAWRENCE, T.W.	ED30		
JANNAF Rocket Nozzle Technology Subcommittee Executive Committee Report—Presentation. For presentation at the 51st JANNAF Propulsion Meeting, Lake Buena Vista, FL, November 18–21, 2002.		LIN, B.	UAB
		ZHU, S.	SD46
		BAN, H.	UAB
		LI, C.	UAB
		SCRIPA, R.N.	UAB
		SU, C.H.	SD46

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LEHOCZKY, S.L.	SD46	BORGSTAHL, G.	SD46
Modified Laser Flash Method for Thermal Properties Measurements and the Influence of Heat Convection—Abstract Only. For presentation at and publication in Proceedings of the International Mechanical Engineering Congress and Research & Development Exposition, Washington, DC, November 16–21, 2003.		Macromolecular Topography Leaps Into the Digital Age—Abstract Only. For presentation at the American Crystallographic Association Meeting, Covington, KY, July 26–31, 2003.	
LIN, B.	UAB	LU, H.	USRA
ZHU, S.	SD46	ROBERTSON, F.R.	SD60
BAN, H.	UAB	A Variational Analysis of Divergence Profiles Based Upon Column-Integrated Mass, Moisture and Energetic Constraints With Satellite-Derived Boundary Fluxes—Abstract Only. For publication in the Journal of Meteorology and Atmospheric Physics, 2003.	
LI, C.	UAB		
SCRIPA, R.N.	UAB		
SU, C.-H.	SD46		
LEHOCZKY, S.L.	SD46	MACH, D.	UAH
Thermal Property Measurement of Semiconductor Melt Using Modified Laser Flash Method—Abstract Only. For presentation at the ASME Summer Heat Transfer Conference, Las Vegas, NV, July 20–23, 2003.		BLAKESLEE, R.J.	SD60
		BAILEY, J.C.	Raytheon ITSS
		FARRELL, W.M.	Goddard Space Flight Center
		GOLDBERG, R.A.	Goddard Space Flight Center
		DESCH, M.D.	Goddard Space Flight Center
		HOUSER, J.G.	Goddard Space Flight Center
LITCHFORD, R.J.	TD40	Preliminary Optical and Electric Field Pulse Statistics From Storm Overflights During the Altus Cumulus Electrification Study—Abstract Only. For presentation at the International Conference on Atmospheric Electricity, Versailles, France, June 9–13, 2003.	
Performance Theory of Diagonal Conducting Wall MHD Accelerators—Final Paper. For presentation at the 34th AIAA Plasmadynamics & Lasers Conference, Orlando, FL, June 23–26, 2003.			
LITCHFORD, R.J.	TD40	MACLEOD, T.C.	SD22
COLE, J.W.	TD40	HO, F.D.	UAH
RODGERS, S.L.	TD40	Design of a Ferroelectric Programmable Logic Gate Array—Abstract Only. For presentation at and publication in Proceedings of 14th International Symposium on Integrated Ferroelectrics, Colorado Springs, CO, March 9–12, 2003.	
SACKHEIM, R.	DA01		
Advanced Space Propulsion: A Research Perspective—Presentation. For presentation at the Propulsion Engineering Research Center 14th Annual Symposium on Propulsion, University Park, PA, December 10–11, 2002.			
LO, C.P.	University of Georgia	MAJUMDAR, A.K.	ED25
QUATTROCHI, D.A.	SD60	Numerical Modeling of Unsteady Thermofluid Dynamics in Cryogenic Systems—Final Paper. For presentation at the Thermal & Fluids Analysis Workshop, Hampton, VA, August 18–22, 2003.	
Land Use and Land Cover Change, Urban Heat Island Phenomenon, and Health Implications: A Remote Sensing Approach—Abstract Only. For publication in Photogrammetric Engineering and Remote Sensing, 2003.			
LORENZINI, E.C.	Harvard-Smithsonian	MAJUMDAR, A.K.	ED25
WELYN, K.J.	TD55	FLACHBART, R.H.	ED25
COSMO, M.L.	Harvard-Smithsonian	Numerical Modeling of Fluid Transient in Cryogenic Fluid Network of Rocket Propulsion System—Abstract Only. For presentation at the ASME/JSME Joint Fluids Engineering Conference and 2nd International Symposium on Water Hammer, Honolulu, HI, July 6–10, 2003.	
Expected Deployment Dynamics of ProSEDS—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.			
LOVELACE, J.	SD46	MAJUMDAR, A.K.	ED25
BELLAMY, H.	SD46	STEADMAN, T.	Jacobs Sverdrup
SNELL, E.H.	SD46	Numerical Modeling of Thermofluid Transients During Chilldown of Cryogenic Transfer Lines—Abstract Only. For presentation at the 33rd International Conference	

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on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.	LEWIS, R.A. FANT, W.E.	R. Lewis Company Cortez III
MARKUSIC, T.E. High-Energy, Two-Stage Pulsed Plasma Thruster— Abstract Only. For presentation at the 39th AIAA/ ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	TD40	Overview of the High-Performance Antiproton Trap (HiPAT) Experiment—Presentation. For presentation at the 17th International Conference on the Applications of Accelerators in Research and Industry, Denton, TX, November 12–16, 2002.
MARKUSIC, T.E. Liquid-Metal-Fed Pulsed Plasma Thrusters—Abstract Only. For presentation at the Advanced Space Propulsion Workshop, Huntsville, AL, April 15–17, 2003.	TD40	MARTIN, J.J. LEWIS, R.A. CHAKRABARTI, S. SIMS, W.H. PEARSON, J.B. FANT, W.E.
MARKUSIC, T.E. Liquid-Metal-Fed Pulsed Plasma Thrusters for In-Space Propulsion—Abstract Only. For presentation at the 52nd JANNAF Propulsion Meeting/1st Liquid Propulsion Subcommittee Meeting, Las Vegas, NV, May 10–13, 2004.	TD40	TD40 R. Lewis Co. TD40 TD40 TD40 Cortez III
MARKUSIC, T.E. CHOUERI, E.Y. Princeton University Phenomenological Model of Current Sheet Canting in Pulsed Electromagnetic Accelerators—Abstract Only. For presentation at the 28th International Electric Propulsion Conference, Toulouse, France, March 17–21, 2003.	TD40	Ion Dynamic Capture Experiments With the High- Performance Antiproton Trap (HiPAT)—Final Paper. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.
MARSHALL, H. TENNANT, A.F. GRANT, C. HITCHCOCK, A. O'DELL, S.L. PLUCINSKY, P.	SD50 SD50 SD50 SD50 SD50 SD50	MARTIN, J.J. LEWIS, R.A. PEARSON, J.B. SIMS, W.H. CHAKRABARTI, S. FANT, W.E. MCDONALD, S.
Composition of the Chandra ACIS Containment—Abstract Only. For presentation at and publication in Proceedings on SPIE Optical Science and Technology 48th Annual Meeting, San Diego, CA, August 3–8, 2003; and for pre- sentation at the Optics for EUV, X-Ray, and Gamma-Ray Astronomy Conference, San Diego, CA, August 3–8, 2003.	SD50	Radio Frequency Manipulation and Detection of Protons in the High-Performance Antiproton Trap (HiPAT) Experiment—Abstract Only. For presentation at the Work- shop on Non-Neutral Plasmas, Santa Fe, NM, July 7–11, 2003, and for presentation at the 45th APS/DPP Meeting, Albuquerque, NM, October 27–31, 2003.
MARSHALL, S. OGLESBY, R.J. DROBOT, S. ANDERSON, M.	Rocky Mountain College SD60 University of Colorado University of Nebraska	MARTIN, J.J. LEWIS, R.A. PEARSON, J.B. SIMS, W.H. CHAKRABARTI, S. FANT, W.E. MCDONALD, S.
Simulating Snow Over Sea Ice in Climate Models—Abstract Only. For presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 8–12, 2002.	SD60	Review of the High-Performance Antiproton Trap (HiPAT) Experiment at the Marshall Space Flight Center—Abstract Only. For presentation at the Workshop on Non-Neutral Plasmas, Santa Fe, NM, July 7–11, 2003, and for pre- sentation at the 45th APS/DPP Meeting, Albuquerque, NM, October 27–31, 2003.
MARTIN, J.J. CHAKRABARTI, S. PEARSON, J.B. SIMS, W.H.	TD40 TD40 TD40 TD40	MARTIN, J.J. LEWIS, R.A. SIMS, W.H. CHAKRABARTI, S. PEARSON, J.B. FANT, W.E.
		TD40 TD40 TD40 TD40 TD40 TD40

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Stacking Multiple Ion Captures in the High-Performance Antiproton Trap (HiPAT)—Abstract Only. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 8–11, 2004.		CHRISTIAN, H.J.	SD60
		BOCCIPPIO, D.J.	SD60
		KOSHAK, W.J.	SD60
		BAILEY, J.C.	Raytheon
		HALL, J.M.	Raytheon
MARTIN, J.J.	TD40	BATEMAN, M.G.	USRA
LEWIS, R.A.	TD40	A Total Lightning Climatology for the Tennessee Valley Region—Abstract Only. For presentation at the International Conference on Atmospheric Electricity, Versailles, France, June 9–13, 2003.	
STANOJEV, B.	TD40		
A Scintillation Counter System Design to Detect Antiproton Annihilation Using the High-Performance Antiproton Trap (HiPAT)—Abstract Only. For presentation at the STAIF 2004 Conference, Albuquerque, NM, February 8–12, 2004.		MELLENDEZ, M.	University of Texas, El Paso
		TANG, W.	University of South Carolina
		MCCLURE, J.C.	University of Texas, El Paso
MARTINEZ-GALARCE, D.S.	SD50	NUNES, A.C., JR.	ED30
WALKER, A.B.C.	SD50	MURR, L.E.	University of Texas, El Paso
BARBEE, T.W., II	SD50	Tool Forces Developed During Friction Stir Welding—Final Paper. For publication in Science and Technology of Welding and Joining, 2003.	
HOOVER, R.B.	SD50		
The Solar Chromosphere/Corona Interface I. FUV-EUV Observations and Modeling of Unresolved Coronal Funnels—Abstract Only. For publication in The Astrophysical Journal, 2003.		MELLEN, D.P.	ED41
		GARCIA, D.	ED41
		VAUGHAN, W.W.	UAH
MAXWELL, T.G.	FD42	Engineering Lessons Learned and Technical Standards Integration: Capturing Key Technologies for Future Space Missions—Final Paper. For presentation at the AIAA Space Conference and Exposition, Long Beach, CA, September 23–25, 2003.	
Planning Systems for Distributed Operations—Viewgraphs Only. For presentation at the Ground System Architectures Workshop, Manhattan Beach, CA, March 4–6, 2003.			
MAZURUK, K.	SD46	MELTON, T.	FD32
Stability Analysis of Flow Induced by the Traveling Magnetic Field—Abstract Only. For presentation at the Microgravity Transport Processes in Fluid, Thermal, Biological, and Materials Sciences Conference III, Davos, Switzerland, September 14–19, 2003.		ONKEN, J.	FD32
		International Cooperation of Payload Operations on the <i>International Space Station</i> —Abstract Only. For presentation at the AIAA/ICAS International Air and Space Symposium, Dayton, OH, July 14–17, 2003.	
MAZURUK, K.	SD46		
GRUGEL, R.N.	SD46	MERKLE, C.L.	UT Space Institute
The Effect of Rotating a Faraday Disc Perpendicular to an Applied Magnetic Field: Theory and Experiment—Abstract Only. For publication in Physical Review E, 2003.		SANKARAN, V.	UT Space Institute
		DORNEY, D.J.	TD64
MCCAUL, E.W., JR.	USRA	SONDAK, D.L.	Boston University
BUECHLER, D.E.	UAH	A Generalized Fluid Formulation for Turbomachinery Computations—Final Paper. For presentation at the 33rd AIAA Fluid Dynamics Conference, Orlando, FL, June 23–26, 2003.	
GOODMAN, S.J.	SD60		
CAMMARATA, M.	National Weather Service	MIERNIK, J.H.	ERC, Inc.
Doppler Radar and Lightning Network Observations of a Severe Outbreak of Tropical Cyclone Tornadoes—Abstract Only. For publication in Monthly Weather Review, 2003.		TROLINGER, J.D.	MetroLaser, Inc.
		LACKEY, J.D.	ED24
		MILTON, M.E.	ED24
		WAGGONER, J.D.	ED24
MCCAUL, E.W., JR.	USRA	POPE, R.D.	Qualis Corporation
GOODMAN, S.J.	SD60	Spaceflight Holography Investigation in a Virtual Apparatus (SHIVA) Ground Experiments and Concepts for Flight Design—Abstract Only. For presentation at	
BUECHLER, D.E.	UAH		
BLAKESLEE, R.J.	SD60		

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the 41st AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 6–9, 2003.		MOORE, R.L.	SD50
		FALCONER, D.A.	SD50
		PORTER, J.G.	SD50
MIKELLIDES, I.G.	SAIC	HATHAWAY, D.H.	SD50
MANDELL, M.J.	SAIC	Solar Coronal Heating and the Magnetic Flux Content	
KUHARSKI, R.A.	SAIC	of the Network—Abstract Only. For presentation at the	
DAVIS, D.A.	SAIC	AAS Solar Physics Division Annual Meeting, Laurel, MD,	
GARDNER, B.M.	SAIC	June 16–20, 2003.	
MINOR, J.	ED03		
The Electric Propulsion Interactions Code (EPIC): A		MORRIS, C.I.	TD40
Member of the NASA Space Environment and Effects		Numerical Modeling of Pulse Detonation Rocket Engine	
Program (SEE) Toolset—Final Paper. For presentation		Gasdynamics and Performance—Abstract Only. For	
at the 39th AIAA/ASEE/SAE/ASEE Joint Propulsion		presentation at the 42nd AIAA Aerospace Sciences	
Conference, Huntsville, AL, July 20–23, 2003.		Meeting and Exhibit and Exhibit, Reno, NV, January 5–8,	
		2004.	
MITROFANOV, I.G.	SD50		
ANFIMOV, D.S.	SD50	MORRIS, C.I.	TD40
BRIGGS, M.S.	SD50	Pulse Detonation Rocket Engine Research at NASA	
FISHMAN, G.J.	SD50	Marshall—Final Paper. For presentation at the 16th ONR	
KIPPEN, R.M.	SD50	Propulsion Meeting, Los Angeles, CA, June 9–11, 2003.	
LITVAK, M.L.	SD50		
MEEGAN, C.A.	SD50	MORRIS, C.I.	TD40
PACIESAS, W.S.	SD50	Quasi-One-Dimensional Modeling of Pulse Detonation	
PREECE, R.D.	SD50	Rocket Engines—Presentation and Paper. For presentation	
SANIN, A.B.	SD50	at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion	
Analysis Methods and Results for Weak Gamma-Ray		Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
Bursts in the BATSE Data—Abstract Only. For publication			
in The Astrophysical Journal, 2003.			
MONELL, D.	VS30	MORRIS, C.I.	TD40
MATHIAS, D.	Ames Research Center	Quasi-One-Dimensional Study of Pulse Detonation Rocket	
REUTHER, J.	Ames Research Center	Engine Blowdown Gasdynamics and Performance—Final	
GARN, M.	Langley Research Center	Paper. For presentation at the Propulsion Engineering	
Multi-Disciplinary Analysis for Future Launch Systems		Research Center 14th Annual Symposium on Propulsion,	
Using NASA's Advanced Engineering Environment		University Park, PA, December 10–11, 2002.	
(AEE)—Final Paper. For presentation at the 16th AIAA			
Computational Fluid Dynamics Conference, Orlando, FL,		MURDOCH, K.	Hamilton Sundstrand
June 23–26, 2003.		PERRY, J.L.	FD21
		SMITH, F.	FD21
		Sabatier Engineering Development Unit—Final Paper.	
		For presentation at the 33rd International Conference	
		on Environmental Systems, Vancouver, BC, Canada,	
		July 7–10, 2003.	
MONTGOMERY, E.E., IV	TD15		
GARBE, G.P.	TD15	NALL, M.	SD10
HEATON, A.F.	TD15	Commercial Research Results From the <i>International</i>	
Places Only Sails Can Go—Final Paper. For presentation at		<i>Space Station</i> —Abstract Only. For presentation at the 41st	
the AIAA/ICAS International Air and Space Symposium,		AIAA Aerospace Science Meeting and Exhibit, Reno, NV,	
Dayton, OH, July 14–17, 2003.		January 6–9, 2003.	
MOORE, R.L.	SD50		
DAVIS, J.M.	SD50	NESMAN, T.E.	TD63
HATHAWAY, D.H.	SD50	Shuttle Fuel Feedliner Cracking—Presentation. For	
Magnetic Transition Region Probe (MTRAP)—Abstract		presentation at the MSFC Fall Workshop on Fluids,	
Only. For presentation at NASA's Living With a Star		Huntsville, AL, November 19–21, 2002.	
Science Workshop, Laurel, MD, November 13–15, 2002.			

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NETTLES, A.T.	ED34	WESTH, P.	Roskilde University
Permeability After Impact Testing of Composite Laminates—Final Paper. For presentation at the SAMPE International Symposium & Exhibition, Long Beach, CA, May 11–15, 2003.		A Proposed Mechanism for the Thermal Denaturation of a Recombinant <i>Bacillus halmapalus</i> α amylase—the Effect of Calcium Ions—Abstract Only. For publication in Biochemistry Biophysics Acta, 2003.	
NETTLES, A.T.	ED34	NISHIKAWA, K.	SD50
Polymer Matrix Composites for Propulsion Systems—Final Paper. For presentation at the International Conference on Composites Engineering, New Orleans, LA, May 20–26, 2003.		HARDEE, P.E.	SD50
		RICHARDSON, G.A.	SD50
		PREECE, R.D.	SD50
		SOL, H.	SD50
		FISHMAN, G.J.	SD50
NEWTON, R.L.	ED36	Particle Acceleration and Emission in Relativistic Jets—Abstract Only. For presentation at and publication in Proceedings of the 28th International Cosmic Ray Conference, Tsukuba, Japan, July 31–August 7, 2003.	
The Effects of Proton Radiation on the Mechanical Properties of Diamond Films—Abstract Only. For presentation at Vanderbilt University, Nashville, TN, December 2002.			
NGUYEN, H.H.	TD53	NISHIKAWA, K.	SD50
MARTIN, M.A.	TD53	HARDEE, P.E.	SD50
An Interpolation Method for Obtaining Thermodynamic Properties Near Saturated Liquid and Saturated Vapor Lines—Abstract Only. For presentation at the 52nd JANNAP Propulsion Meeting/1st Liquid Propulsion Subcommittee Meeting, Las Vegas, NV, May 10–13, 2004.		RICHARDSON, G.A.	SD50
		PREECE, R.D.	SD50
		SOL, H.	SD50
		FISHMAN, G.J.	SD50
		Particle Acceleration and Emission in Relativistic Jets—Poster Presentation. For presentation at Particle Acceleration in Astrophysical Objects, Cracow, Poland, June 24–28, 2003.	
NICHOLS, J.	TD62	NISHIKAWA, K.	SD50
TYGIELSKI, P.	TD62	HARDEE, P.E.	SD50
URQUIDI, R.	Rocketdyne/Boeing	RICHARDSON, G.A.	SD50
STANGELAND, M.L.	Rocketdyne/Boeing	PREECE, R.D.	SD50
Evaluation of the Spherical Flange Concept for a Rocket Engine—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		SOL, H.	SD50
		FISHMAN, G.J.	SD50
		Particle Acceleration and Radiation Associated With Magnetic Field Generation From Relativistic Collisionless Shocks—Abstract Only. For presentation at and publication in Proceedings of the Gamma Ray Burst Symposium, Santa Fe, NM, September 8–12, 2003.	
NICHOLS, K.F.	FD41	NISHIKAWA, K.	SD50
BEST, S.	FD41	HARDEE, P.E.	SD50
SCHNEIDER, L.	Lockheed Martin	RICHARDSON, G.A.	SD50
Making Wireless Networks Secure for NASA Mission-Critical Applications Using Virtual Private Network (VPN) Technology—Abstract Only. For presentation at the SpaceOps 2004, Montreal, PQ, Canada, May 17–21, 2004.		PREECE, R.D.	SD50
		SOL, H.	SD50
		FISHMAN, G.J.	SD50
		Particle Acceleration of Relativistic Jets Due to Weibel Instability—Abstract Only. For publication in The Astrophysical Journal.	
NIEDERMEYER, M.	ED34	NISHIKAWA, K.	SD50
X–33 LH ₂ Tank Failure Investigation Findings—Presentation. For presentation at the International Conference on Composites Engineering, New Orleans, LA, July 20–26, 2003.		RICHARDSON, G.A.	SD50
		PREECE, R.D.	SD50
		HARDEE, P.E.	SD50
NIELSEN, A.D.	Roskilde University		
PUSEY, M.L.	SD48		
FUGLSANG, C.C.	Novozymes A/S		

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KOIDE, S.	SD50	PEACOCK, A.	University of Tennessee
SHIBATA, K.	SD50	HOOVER, R.B.	SD50
KUDOH, T.	SD50	ET AL.	
SOL, H.	SD50	Indigenous and Contaminant Microbes in Ultradeep	
FISHMAN, G.J.	SD50	Mines—Abstract Only. For publication in the Journal of	
The Formation of Relativistic Jets From Kerr Black		Applied Microbiology, 2003, and for publication in the	
Holes—Poster Presentation. For presentation at the		Journal of Environmental Microbiology, 2003.	
Particle Acceleration in Astrophysical Objects, Cracow,			
Poland, June 24–28, 2003.		OSBORNE, R.	ERC, Inc.
		WEHRMEYER, J.	Vanderbilt University
O'DELL, S.L.	SD50	TRINH, H.P.	TD61
BAKER, M.	SD50	EARLY, J.	Los Alamos National Laboratory
CONTENT, D.	SD50	Evaluation and Characterization Study of Dual Pulse	
FREEMAN, M.	SD50	Laser-Induced Spark (DPLIS) for Rocket Engine Ignition	
GLENN, P.	SD50	System Application—Final Paper. For presentation at	
GUBAREV, M.	SD50	the 39th AIAA/ASME/SAE/ASEE Joint Propulsion	
HAIR, J.	SD50	Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
JONES, W.	SD50		
ET AL.		OSTROGORSKY, A.	Rensselaer Polytechnic Institute
X-Ray Testing Constellation-X Optics at MSFC's		MARIN, C.	Rensselaer Polytechnic Institute
100-m Facility—Abstract Only. For presentation at		CHURILOV, A.	Rensselaer Polytechnic Institute
and publication in Proceedings of SPIE Optical Science		VOLZ, M.P.	SD46
and Technology 48th Annual Meeting, San Diego, CA,		BONNER, W.A.	Crystallog Inc.
August 3–8, 2003.		SPIVEY, R.A.	Tec-Masters, Inc.
		SMITH, G.A.	UAH
OCHOA, O.	Texas A&M University	Solidification Using the Baffle in Sealed Ampoules—	
JIANG, J.	Texas A&M University	Abstract Only. For presentation at the 41st AIAA Aerospace	
PUTNAM, D.	Texas A&M University	Sciences Meeting and Exhibit, Reno, NV, January 6–9,	
LO, Z.	Texas A&M University	2003.	
ELLIS, A.	Texas A&M University		
EFFINGER, M.	ED34	PANDEY, A.B.	Pratt & Whitney
Transverse Coefficient of Thermal Expansion Mea-		SHAH, S.	UP30
surements of Carbon Fibers Using ESEM at High		SHADOAN, M.	UP30
Temperatures—Abstract Only. For presentation at the		Development of a Novel Discontinuously Reinforced	
27th Annual Conference on Composites, Materials, and		Aluminum for Space Applications—Abstract and Charts.	
Structures, Cocoa Beach, FL, January 27–30, 2003.		For presentation at the AeroMat 2003 Conference, Dayton,	
		OH, June 9–12, 2003.	
OLIVER, S.T.	ED33		
SELVIDGE, S.	ED33	PANDEY, A.B.	Pratt & Whitney
WATWOOD, M.C.	ERC, Inc.	SHAH, S.	ED33
Measuring Permeability of Composite Cryotank		SHADOAN, M.	TD07
Laminants—Abstract Only. For presentation at the 45th		High-Strength Discontinuously Reinforced Aluminum	
AIAA/ASME/ASCE/AHS/ASC Structures, Structural		for Rocket Applications—Abstract Only. For presentation	
Dynamics, and Materials Conference, Palm Springs, CA,		at the TMS Materials Science and Technology 2003	
April 19–22, 2004.		Conference, Chicago, IL, November 9–12, 2003.	
ONSTOTT, T.C.	Princeton University	PANDEY, A.B.	Pratt & Whitney
MOSER, D.P.	Pacific Northwest National Lab	SHAH, S.	UP30
PIFFNER, S.M.	University of Tennessee	SHADOAN, M.	UP30
FREDRICKSON, J.K.	Pacific Northwest National Lab	Selection and Evaluation of an Alloy for Nozzle	
BROCKMAN, F.J.	Pacific Northwest National Lab	Application—Abstract and Charts. For presentation at	
PHELPS, T.J.	Oak Ridge National Lab	the AeroMat 2003 Conference, Dayton, OH, June 9–12,	
WHITE, D.C.	University of Tennessee	2003.	

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PARK, O.Y.	ATK Thiokol Propulsion	EL-LESSY, H.N.	Boeing
LAWRENCE, T.W.	ED34	MANUEL, S.	Boeing
High-Temperature Permeability of Carbon Cloth Phenolic Composite—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		TUCKER, C.D.	Boeing
		Post-Flight Sampling and Loading Characterization of Trace Contaminant Control Subassembly Charcoal—Final Paper. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.	
PATEL, S.K.	SD50		
KOUVELIOTOU, C.	SD50		
TENNANT, A.F.	SD50	PERRY, J.L.	FD21
WOODS, P.M.	SD50	PETERSON, B.V.	Dynamac Corporation
KINGS, A.	SD50	Cabin Air Quality Dynamics On Board the <i>International Space Station</i> —Final Paper. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.	
UBERTINI, P.	SD50		
WINKLER, C.	SD50		
COURVOISIER, T.	SD50		
VAN DER KLIS, M.	SD50		
ET AL.		PERRY, J.L.	FD21
The Peculiar X-Ray Transient IGR 16358-4726—Abstract Only. For publication in <i>The Astrophysical Journal Letters</i> , 2003.		VON JOUANNE, R.G.	Boeing
		TURNER, E.H.	Boeing
		<i>International Space Station</i> Bacteria Filter Element Post-Flight Testing and Service Life Prediction—Final Paper. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.	
PATTON, B.W.	TD40		
HOLLOWAY, J.P.	University of Michigan		
Some Remarks on GMRES for Transport Theory—Final Paper. For presentation at the Nuclear Mathematical and Computational Sciences ANS Tropical Meeting, Gatlinburg, TN, April 6–11, 2003.			
		PEVTSOV, A.A.	SD50
PEARSON, J.B.	TD40	HAGYARD, M.J.	SD50
SIMS, W.H.	TD40	BLEHM, Z.	SD50
Review of the High-Performance Antiproton Trap (HiPat) experiment at the Marshall Space Flight Center—Abstract and Charts. For presentation at the Advance Space Propulsion Workshop, Huntsville, AL, April 15–17, 2003.		SMITH, J.E.	SD50
		CANFIELD, R.C.	SD50
		SAKURAI, T.	SD50
		On a Cyclic Variation of the Hemispheric Helicity Rule—Abstract Only. For presentation at the International Astronomical Union General Assembly, Sydney, Australia, July 13–16, 2003.	
PECK, J.A.	ED21		
MAHADEVAN, S.	Vanderbilt University	PIKUTA, E.V.	SD50
Optimization-Based Efficiencies in First-Order Reliability Analysis—Final Paper. For presentation at the AIAA Structures, Structural Dynamics, and Materials Conference, Norfolk, VA, April 7–10, 2003.		HOOVER, R.B.	SD50
		MARSIC, D.	UAH
		BEJ, A.K.	UAB
		GARRIOTT, O.	UAH
PERRY, J.L.	FD21	Thermococcus Thireducens Sp. Nov., a Novel Hyperthermophilic, Obligately Sulfur-Reducing Archaeon from a Deep-Sea Hydrothermal Vent—Abstract Only. For publication in the <i>International Journal of Systematic and Evolutionary Microbiology</i> , 2003.	
Octafluoropropane Concentration Dynamics on Board the <i>International Space Station</i> —Final Paper. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.			
PERRY, J.L.	FD21		
COLE, H.E.	Boeing		
CRAMBLITT, E.L.	Boeing		

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PIKUTA, E.V.	SD50	PUSEY, M.L.	SD46
HOOVER, R.B.	SD50	An Alternative Hypothesis for How Microgravity Improves	
MARSIC, D.	UAH	Macromolecular Crystal Quality—Abstract Only. For	
WHITMAN, W.B.	University of Georgia	presentation at the American Crystallographic Association	
TANG, J.	American Type Culture	Meeting, Covington, KY, July 26–31, 2003.	
KRADER, P.	American Type Culture		
Gelidivirgula Patagoniensis Gen. Nov., Sp. Nov., a Novel		PUSEY, M.L.	SD46
Psychrotolerant, Spore-Forming Anaerobe Isolated From		DOWELL, J.	UAH
Magellanic Penguin Guano in Patagonia, Chile—Abstract		GAVIRA-GALLARDO, J.A.	UAH
Only. For publication in the International Journal of		NG, J.D.	UAH
Systematic and Evolutionary Microbiology, 2003.		Purification, Crystallization, and Preliminary X-Ray	
		Analysis of Native Canavalin—Abstract Only. For	
		presentation at the American Crystallographic Association	
		Meeting, Covington, KY, July 26–31, 2003.	
PLATT, M.J.	Concepts NREC		
MARSH, M.	TD61	PUSEY, M.L.	SD46
Thermo-Mechanical Modeling and Analysis for		GORTI, S.	SD46
Turbopump Assemblies—Presentation. For presentation at		FORSYTHE, E.L.	USRA
the Thermal & Fluids Analysis Workshop, Hampton, VA,		KONNERT, J.	Naval Research Laboratory
August 18–22, 2003.		AFM Studies of Salt Concentration Effects on the (110)	
		Surface Structure of Tetragonal Lysozyme Crystals—	
		Abstract Only. For presentation at the Biophysical Society	
		Meeting, San Antonio, TX, March 1–5, 2003.	
PLATT, M.J.	Concepts NREC		
YU, M.M.	Concepts NREC	PUSEY, M.L.	SD46
MARSH, M.	TD61	VAN DER WOERD, M.J.	USRA
Multi-Disciplinary Optimization of a LH ₂ Turbopump		FERREE, D.S.	USRA
Design in an Agile Engineering Environment—Final		The Promise of Macromolecular Crystallization in	
Paper. For presentation at the 39th AIAA/ASME/SAE/		Microfluidic Chips—Abstract Only. For publication in the	
ASEE Joint Propulsion Conference/Exhibit, Von Braun		Journal of Structural Biology, 2003.	
Center, Huntsville, AL, July 20–23, 2003.			
		QUINN, J.E.	TD51
POLSGROVE, T.	TD30	ISTAR: Project Status and Ground Test Engine Design—	
MSFC MXER Tether Study—Interim Report—Charts. For		Final Paper. For presentation at the 39th AIAA/ASME/	
presentation at the Advanced Space Propulsion Workshop,		SAE/ASEE Joint Propulsion Conference/Exhibit,	
Huntsville, AL, April 15–17, 2003.		Huntsville, AL, July 20–23, 2003.	
PORTER, J.G.	SD50	RAMACHANDRAN, N.	USRA
WEST, E.A.	SD50	LESLIE, F.W.	SD46
DAVIS, J.M.	SD50	Control of Thermal Convection in Layered Fluids Using	
GARY, G.A.	SD50	Magnetic Fields—Abstract Only. For presentation at	
NOBLE, M.W.	SD50	the Microgravity Transport Processes in Fluid, Thermal,	
THOMAS, R.J.	Goddard Space Flight Center	Biological, and Materials Sciences Conference III, Davos,	
RABIN, D.M.	Goddard Space Flight Center	Switzerland, September 14–19, 2003.	
UITENBROEK, H.	NSO		
SUMI—The Solar Ultraviolet Magnetograph Inves-			
tigation—Abstract Only. For presentation at the AAS Solar			
Physics Division, Laurel, MD, June 16–20, 2003.			
PRINCE, F.A.	VS20	RAMACHANDRAN, N.	BAE/SD46
Weight and the Future of Space Flight Hardware Cost		LESLIE, F.W.	SD46
Modeling—Final Paper. For presentation at the International		Magnetic Control of Solutal Buoyancy-Driven Con-	
Society of Parametric Analysts/Society of Cost Estimating		vection—Abstract Only. For publication in Nature, 2003,	
and Analysis 2003 International Conference, Orlando, FL,		and Physical Review Letters, 2003.	
June 17–20, 2003.			

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RAMACHANDRAN, N.	USRA	Only. For presentation at the Optics for EUV, X-Ray, and
LESLIE, F.W.	SD46	Gamma-Ray Astronomy Conference, San Diego, CA,
Using Strong Magnetic Fields to Control Solutal		August 3–8, 2003.
Convection—Abstract Only. For presentation at the		
Microgravity Transport Processes in Fluid, Thermal,		RAMSEY, B.D.
Biological, and Materials Sciences Conference III, Davos,		SD50
Switzerland, September 14–19, 2003.		GUBAREV, M.
		SD70
		APPLE, J.
		SD50
		Gas Scintillation Proportional Counters for High-Energy
		X-Ray Astronomy—Abstract Only. For presentation at
		the Optics for EUV, X-Ray, and Gamma-Ray Astronomy
		Conference, San Diego, CA, August 3–8, 2003.
RAMACHANDRAN, N.	BAE/SD46	
MAJUMDAR, A.K.	ED25	
MCDANIELS, D.M.	TD63	
STEWART, E.	ED25	
A Tabletop Tool for Modeling Life Support Systems—		RAMSEY, B.D.
Abstract Only. For presentation at the Conference on		SD50
Space Technologies, Colorado Springs, CO, Novem-		SPEEGLE, C.O.
ber 4–6, 2003.		Raytheon ITSS
		GASKIN, J.
		UAH
		SHARMA, D.
		SD50
		ENGELHAUPT, D.
		UAH
		Development of High-Resolution Mirrors and Cd-Zn-Te
		Detectors for Hard X-Ray Astronomy—Abstract Only. For
		presentation at the Optical Society of America—Optics
		in the Southeast: Topical Meeting and Tabletop Exhibit,
		Huntsville, AL, October 24–25, 2002.
RAMSEY, B.D.	SD50	
BASSO, S.	Osservatorio Astronomico di Brera	
BRUNI, R.J.	Harvard-Smithsonian	
CITERIO, O.	Osservatorio Astronomico di Brera	
ENGELHAUPT, D.	UAH	
GHIGO, M.	Osservatorio Astronomico di Brera	
GOENSTIEN, P.	Harvard-Smithsonian	
MAZZOLENI, F.	Osservatorio Astronomico di Brera	
O'DELL, S.L.	SD50	
SPEEGLE, C.O.	Raytheon ITSS	
Development of a Prototype Nickel Optic for the		REINISCH, B.W.
Constellation-X Hard-X-Ray Telescope—Abstract Only.		SD50
For presentation at the Optics for EUV, X-Ray, and		HUANG, X.
Gamma-Ray Astronomy Conference, San Diego, CA,		SD50
July 31–August 4, 2003.		SONG, P.
		SD50
		GREEN, J.L.
		SD50
		FUNG, S.F.
		SD50
		VASYLIUNAS, V.W.
		SD50
		GALLAGHER, D.L.
		SD50
		SANDEL, B.R.
		SD50
		Plasmaspheric Mass Loss and Refilling as a Result of a
		Magnetic Storm—Abstract Only. For publication in the
		Journal of Geophysical Research, 2003.
RAMSEY, B.D.	SD50	
ELSNER, R.F.	SD50	
ENGELHAUPT, D.	UAH	
GUBAREV, M.	USRA	
KOŁODZIEJCZAK, J.	SD50	
MARTIN, G.	ERC, Inc.	
O'DELL, S.L.	SD50	
SPEEGLE, C.O.	Raytheon ITSS	
WEISSKOPF, M.C.	SD50	
AM03-AM121-115 Hard-X-Ray Optics Development		RICHARDSON, G.A.
at MSFC—Abstract Only. For presentation at and		Natl. Space Science and Tech. Ctr.
publication in Proceedings of the Optics for EUV, X-Ray,		
and Gamma-Ray Astronomy Conference, San Diego, CA,		CHUNG, T.J.
July 31–August 4, 2003.		SD50
		Finite Element Method for Capturing Ultra-Relativistic
		Shocks—Abstract Only. For publication in The Astro-
		physical Journal, 2003.
		RICHMOND, R.C.
		SD46
		Macromolecular Expression and Function—A New
		Paradigm for NASA Risk Assessment—Abstract Only.
		For presentation at the Biotechnology Research Seminar,
		Huntsville, AL, September 12, 2003.
		RICHMOND, R.C.
		SD46
		CRUZ, A.
		SD46
		JANSEN, H.
		SD46
		BORS, K.
		SD46
		A Biodosimeter for Multiparametric Determination of
		Radiation Dose, Radiation Quality, and Radiation Risk—
RAMSEY, B.D.	SD50	
GASKIN, J.	SD50	
SHARMA, D.	SD50	
SELLER, P.	Rutherford Appleton Laboratory	
Characterization of Pixelated Cadmium-Zinc-Telluride		
Detectors for Astrophysical Applications—Abstract		

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Abstract Only. For presentation at the World Congress on Medical Physics and Biomedical Engineering, Sydney, Australia, August 24–29, 2003.	RODGERS, S.L.	TD40
RITCHIE, S.	University of Alabama	
HOLLADAY, J.	FD23	Al Reisz Engineering
CLARK, D.	FD24	Engines for the Cosmos—Extended Abstract. For publication in Mechanical Engineering, October/November 2002.
HOLT, J.M.	ED25	
An Improved Design for Air Removal From Aerospace Fluid Loop Collant Systems—Abstract Only. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.	ROE, F.D.	ED19
	HOWARD, R.T.	ED19
	The Successful Development of an Automated Rendezvous and Capture (AR&C) System for the National Aeronautics and Space Administration—Final Paper. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.	
ROBERTSON, F.R.	SD60	ROE, F.D.
Interannual Variability of the Tropical Water Cycle: Capabilities in the TRMM Era and Challenges for GPM—Abstract Only. For presentation at the International Union of Geodesy and Geophysics, Sapporo, Japan, June 30–July 11, 2003.		ED19
	HOWARD, R.T.	ED19
	MURPHY, L.	ED19
	Automated Rendezvous and Capture System Development and Simulation for NASA—Abstract Only. For presentation at the SPIE Defense and Security Symposium, Orlando, FL, April 13–15, 2004.	
ROBERTSON, F.R.	SD60	ROEBER, D.
FITZJARRALD, D.E.	SD60	SD46
KUMMEROW, C.D.	Colorado State University	SD46
Effects of Uncertainty in TRMM Precipitation Radar Path Integrated Attenuation on Interannual Variations of Tropical Oceanic Rainfall—Final Paper. For publication in Geophysical Research Letters, 2002.		Genzyme Corp.
		Genzyme Corp.
		Harvard Med School
ROBERTSON, T.	TD40	Crystallization and Preliminary X-Ray Analysis of Human Recombinant Acid B-Glucocerebrosidase, A Treatment for Gaucher's Disease—Abstract Only. For publication in Acta Crystallographica Section D, 2002.
NORLEY, G.D.		
A Review of Past Insights by Robert Forward and Current Advanced Propulsion Activities—Abstract Only. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 8–11, 2004.	ROEBER, D.	SD46
	ACHARI, A.	SD46
	TAKAI, T.	Asahi Breweries, Ltd.
	OKUMURA, Y.	Asahi Breweries, Ltd.
	SCOTT, D.L.	Harvard Med School
ROCKER, M.	TD64	Crystallization and Preliminary X-Ray Analysis of Der f 2, A Potent Allergen Derived From the House Dust Mite (Dermatophagoides farinae)—Abstract Only. For publication in Acta Crystallographica Section D, 2002.
NESMAN, T.E.	TD63	
HULKA, J.R.	TD61	
DOUGHERTY, N.S.	TD63/ERC	
A Review of Lox/Kerosene Combustion Instability in American and Russian Combustion Devices in Application to Next-Generation Launch Technology—Abstract Only. For presentation at the 52nd JANNAF Propulsion Meeting/1st Liquid Propulsion Subcommittee Meeting, Las Vegas, NV, May 10–13, 2004.	ROGERS, J.R.	SD46
	Materials Science Research in the Microgravity Department of the Marshall Space Flight Center—Abstract Only. For presentation at the Kiwanas Club, Huntsville, AL, December 5, 2002.	
ROCKER, M.	TD64	ROGERS, M.
WEST, J.S.	TD62	Luna Innovations, Inc.
Vision for CFD-Based Combustion Instability Predictions—Charts Only. For presentation at the MSFC Spring Workshop on Fluids, Birmingham, AL, April 22–24, 2003.		Virginia Polytechnic Institute
		Virginia Polytechnic Institute
	BAIRD, D.	
	HULCHER, A.B.	ED34

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- Rotationally Molded Liquid Crystalline Polymers—
Abstract Only. For presentation at the International
Conference on Composite Materials, San Diego, CA,
July 14–18, 2003.
- ROGERS, M. Luna Innovations, Inc.
STEVENSON, P. Luna Innovations, Inc.
SCRIBBEN, E. Virginia Polytechnic Institute
BAIRD, D. Virginia Polytechnic Institute
HULCHER, A.B. ED34
Rotationally Molded Liquid Crystalline Polymers—Final
Paper. For presentation at the International Conference on
Composite Materials, San Diego, CA, July 14–18, 2003.
- ROTHERMEL, J. TD64
DORNEY, D.J. TD64
DORNEY, S.M. TD64
CFD-Based Design of Lox Pump Inlet Duct for Reduced
Dynamic Loads—Final Paper. For presentation at the 39th
AIAA/ASME/SAE/ASEE Joint Propulsion Conference/
Exhibit, Huntsville, AL, July 20–23, 2003.
- ROTHERMEL, J. TD64
DORNEY, S.M. TD64
DORNEY, D.J. TD64
CFD-Based Design of Turbopump Inlet Duct for Reduced
Dynamic Loads—Final Paper. For presentation at the
Thermal and Fluids Analysis Workshop, Norfolk, VA,
August 18–22, 2003.
- RUF, J.H. TD64
HAGEMANN, G. Astrium, Germany
IMMICH, H. Astrium, Germany
Comparison of Experimental Data and Computations Fluid
Dynamics Analysis for a Three-Dimensional Linear Plug
Nozzle—Final Paper. For presentation at the 39th AIAA/
ASME/SAE/ASEE Joint Propulsion Conference/Exhibit,
Huntsville, AL, July 20–23, 2003.
- RUF, J.H. TD64
MCDANIELS, D.M. TD64
Altitude Compensating Nozzle Cold Flow Test Results—
Abstract Only. For presentation at the 39th AIAA/
ASME/SAE/ASEE Joint Propulsion Conference/Exhibit,
Huntsville, AL, July 20–23, 2003.
- RUSSELL, S.S. ED32
WALKER, J.L. ED32
LANSING, M.D. ED32
Leak Location and Classification in the Space Shuttle
Main Engine Nozzle by Infrared Testing—Abstract Only.
- For presentation at the ASNT Fall Conference and Quality
Testing Show, Pittsburgh, PA, October 13–17, 2003.
- SACKHEIM, R. DA01
In-Space Propulsion—Where We Stand and What's Next—
Final Paper. For presentation at the Tenth International
Workshop on Combustion and Propulsion, Lerici,
La Spezia, Italy, September 21–25, 2003.
- SACKHEIM, R. DA01
CIKANEK, H.A. GRC
BEAURAIN, A. Snecma Moteurs
SOUCHIER, A. Snecma Moteurs
MORAVIE, M. Snecma Propulsion Solide
Earth-to-Orbit Rocket Propulsion—Final Paper. For
presentation at the International Air & Space Symposium
and Exposition, Dayton, OH, July 12–17, 2003.
- SAFIE, F.M. UP10
DANIEL, C. UP10
KALIA, P. Raytheon ITSS
A Quantitative Reliability, Maintainability, and Sup-
portability Approach for NASA's Second-Generation
Reusable Launch Vehicle—Paper and Presentation.
For presentation at the Workshop on LifeCycle System
Engineering, Redstone Arsenal, AL, November 6–7,
2002.
- SALVAIL, P.G. ED33
CARTER, R.R. ED33
Alkali Metal Handling Practices at NASA MSFC—Final
Paper. For presentation at the Space Technology and
Applications International Forum, Albuquerque, NM,
February 2–5, 2003.
- SCHLAGHECK, R.A. SD41
The NASA Materials Science Research Program—It's
New Strategic Goals and Plans—Abstract Only. For
presentation at the Spacebound 2003 Conference, Toronto,
UT, Canada, May 4–10, 2003.
- SCHNEIDER, J.A. Mississippi State University
NUNES, A.C., JR. ED30
Thermo-Mechanical Processing in Friction Stir Welds—
Final Paper. For presentation at the TMS 132nd Annual
Meeting and Exhibition, San Diego, CA, March 2–6,
2003.

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SCHNEIDER, M.	FD41	SEGRE, P.N.	SD46
Telescience Resource Kit—Viewgraphs Only. For presentation at the Ground System Architectures Workshop, Manhattan Beach, CA, March 4–6, 2003.		Origin of Stability in Particle Sedimentation—Abstract Only. For presentation at the University of Maine, Orono, ME, April 25, 2003.	
SCHNEIDER, M.	FD41	SELVIDGE, S.	ED33
Telescience Resource Kit Software Capabilities and Future Enhancements—Abstract Only. For presentation at the SpaceOps 2004, Montreal, Quebec, Canada, May 17–21, 2004.		WATWOOD, M.C.	ERC
SCHNEIDER, T.	ED31	Measuring Thermal Conductivity at LH ₂ Temperatures—Abstract Only. For presentation at the 45th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Palm Springs, CA, April 19–22, 2004.	
VAUGHN, J.A.	ED31	SEVER, T.L.	SD60
CARRUTH, M.R., JR.	ED30	Future Applications of Remote Sensing to Archeological Research, Chapter 10—Manual of Remote Sensing, John Wiley & Sons, 2003.	
MIKELIDES, I.G.	SAIC	SEVER, T.L.	SD60
JONGEWARD, G.A.	SAIC	Mapping the Ancient Maya Landscape From Space—Abstract Only. For presentation at the NASA Remote Sensing and Archeology Conference, International Space University, Stasbourg, France, November 4, 2002, and for presentation at the Fifth World Archeological Conference, Washington, DC, June 24–26, 2003.	
PETERSON, T.	Glenn Research Center	SEVER, T.L.	SD60
KERSLAKE, T.W.	Glenn Research Center	Mapping the Ancient Maya Landscape From Space—Abstract Only. For presentation at the NASA Remote Sensing and Archeology Conference, International Space University, Stasbourg, France, November 4, 2002, and for presentation at the Fifth World Archeological Conference, Washington, DC, June 24–26, 2003.	
SNYDER, D.	Glenn Research Center	SEVER, T.L.	SD60
FERGUSON, D.	Glenn Research Center	Mapping the Ancient Maya Landscape From Space—Abstract Only. For presentation at the NASA Remote Sensing and Archeology Conference, International Space University, Stasbourg, France, November 4, 2002, and for presentation at the Fifth World Archeological Conference, Washington, DC, June 24–26, 2003.	
HOSKINS, A.	Aerojet	SEVER, T.L.	SD60
High-Voltage Solar Array ARC Testing for a Direct Drive Hall Effect Thruster System—Ground Testing Techniques—Abstract Only. For presentation at the 8th Spacecraft Charging Technology Conference, Huntsville, AL, October 20–24, 2003.		IRWIN, D.	SD60
SCHNELL, A.R.	Tennessee Technological University	Mapping the Ancient Maya Landscape From Space—Abstract Only. For publication in <i>Our Changing Planet: A View From Space</i> , Cambridge University Press, 2003.	
TINKER, M.L.	ED21	SHAH, S.	ED33
Buckling, Stiffness, and Modal Characterization of Foam-Rigidized Thin Film Deployable Structures—Final Paper. For presentation at the AIAA Structures, Structural Dynamics, and Materials Conference, Norfolk, VA, April 7–10, 2003.		WELLS, D.	ED33
SCHOENFELD, M.P.	New Mexico St. University	WAGNER, J.	Langley Research Center
TINKER, M.L.	ED21	BABEL, H.	Boeing
Polyurethane Foam Injection and Expansion in Thin-Film Inflatable Booms Under Semi-Vacuum Conditions—Final Paper. For presentation at the AIAA Structures, Structural Dynamics, and Materials Conference, Norfolk, VA, April 7–10, 2003.		Thermal Exposure Effects on Properties of Al-Li Alloy Plate Products—Abstract and Charts. For presentation at the AeroMat 2003 Conference Conference, Dayton, OH, June 9–12, 2003.	
SCHOFFSTOLL, D.L.	TD53	SHARP, J.R.	ED26
Space Shuttle Main Engine Implications for the Abort-To-Orbit Off-The-Pad Study—Abstract Only. For presentation at the JANNAF/CS/APS/PSHS/MSS Joint Meeting, Colorado Springs, CO, December 1–5, 2003.		KITTREDGE, K.	ED26
SCOTT, D.M.	USRA	SCHUNK, R.G.	ED26
FINGER, M.H.	USRA	Internal Flow Thermal/Fluid Modeling of STS–107 Port Wing in Support of the <i>Columbia</i> Accident Investigation Board—Final Paper. For presentation at the Thermal & Fluids Analysis Workshop, Hampton, VA, August 18–22, 2003.	
WILSON, C.A.	SD50	SHEEHY, J.A.	TD40
Characterization of the Crab Pulsar's Timing Noise—Abstract Only. For publication in <i>MNRAS</i> , 2003.		Plasma Propulsion Research at NASA Marshall Space Flight Center—Abstract Only. For presentation at the 52nd JANNAF Propulsion Meeting/1st Liquid Propulsion Subcommittee Meeting, Las Vegas, NV, May 10–13, 2004.	

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SHEETS, P.	SD60	SMITH, K.A.	Raytheon
SEVER, T.L.	SD60	REYNOLDS, D.W.	FD36
CONYERS, L.	SD60	Restraining Loose Equipment Aboard the <i>International Space Station</i> : The Payload Equipment Restraint System—Final Paper. For presentation at the 33rd International Conference on Environmental Systems, Vancouver, BC, Canada, July 7–10, 2003.	
Aerial and Ground-Based Remote Sensing in Central America—Abstract Only. For publication in the Manual of Remote Sensing, Chapter 9—Aerial and Ground-Based Remote Sensing in Central America, John Wiley and Sons, 2003.			
SINGHAL, S.	ED30	SMITHERMAN, D.V.	FD02
Overview of Probabilistic Methods for SAE G-11 Meeting for Reliability and Uncertainty Quantification for DoD TACOM Initiative With SAE G-11 Division—Abstract Only. For presentation at the SAE G-11 RMSL Division Meeting, Sterling Heights, MI, October 6–8, 2003.		Government and Industry Issue for Expanding Commercial Markets Into Space, Paper No. IAC-02-IAA.13.2.11. For publication in Proceedings of 53rd International Astronautical Congress, The World Space Congress—2002, Houston, TX, October 10–19, 2002.	
SINGHAL, S.	ED30	SMITHERMAN, D.V.	FD02
Overview of the SAE G-11 RMSL (Reliability, Maintainability, Supportability, and Logistics) Division Activities and Technical Projects—Abstract Only. For presentation at the SAE G-11 Division Meeting, West Palm Beach, FL, February 17–19, 2003.		Pathways to Colonization—Final Paper. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.	
SKELLEY, S.	TD63	SNELLGROVE, L.M.	TD63
Summary of Recent Inducer Testing at MSFC and Future Plans—Final Paper. For presentation at the Thermal & Fluids Analysis Workshop, Hampton, VA, August 18–22, 2003.		GRIFFIN, L.W.	TD64
SLEDD, A.M.	FD31	SIEJA, J.P.	TD74
DANFORD, T.M.	FD31	HUBER, F.W.	Riverbend Design Ser.
KEY, R.B.	FD31	Experimental Performance Evaluation of a Supersonic Turbine for Rocket Engine Applications—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
EXPRESS Rack: The Extension of <i>International Space Station</i> Resources for Multidiscipline Subrack Payloads—Final Paper. For presentation at the IEEE Aerospace Conference, Big Sky, MT, March 7–15, 2003.		SONDAK, D.L.	Boston University
SMITH, D.D.	SD46	DORNEY, D.J.	TD64
Enhancement of Optical Nonlinearities in Composite Media and Structures via Local Fields and Electromagnetic Coupling Effects—Abstract Only. For presentation at the 33rd Winter Colloquium on the Physics of Quantum Electronics, Snowbird, UT, January 5–9, 2003.		General Equation Set Solver for Compressible and Incompressible Turbomachinery Flows—Extended Abstract. For presentation at the 39th AIAA/ASEE/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003, and for presentation at the NASA/MSFC Fluids Workshop, Huntsville, AL, November 19–21, 2002.	
SMITH, G.	International Space Systems	SOZEN, M.	Embry-Riddle Aeronautical University
PHILIPS, A.	TD03	MAJUMDAR, A.K.	ED25
Analysis of Parallel Burn, No-Crossfeed TSTO RLV Architectures and Comparison to Parallel Burn With Crossfeed and Series Burn Architectures—Final Paper. For presentation at the 39th AIAA/ASEE/SAE/ASEE Joint Propulsion Conference, Huntsville, AL, July 20–23, 2003.		A Novel Approach for Modeling Chemical Reaction in Generalized Fluid System Simulation Program—Abstract Only. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
SMITH, G.	International Space Systems	SPANN, J.F.	SD50
PHILIPS, A.	TD03	Conjugate Auroral Imagery—Abstract Only. For presentation at and publication in Proceedings of the American Geophysical Union Fall Meeting, San Francisco, CA, December 8–12, 2003.	
Analysis of Parallel Burn, No-Crossfeed TSTO RLV Architectures and Comparison to Parallel Burn With Crossfeed and Series Burn Architectures—Final Paper. For presentation at the 39th AIAA/ASEE/SAE/ASEE Joint Propulsion Conference, Huntsville, AL, July 20–23, 2003.			

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SPIVEY, R.A.	Tec-Masters, Inc.	Design Development Analyses in Support of a Heatpipe-
GILLEY, S.	Tec-Masters, Inc.	Brayton Cycle Heat Exchanger—Abstract Only. For
OSTROGORSKY, A.	RPI	presentation at the Space Technology and Applications
GRUGEL, R.N.	SD46	International Forum, Albuquerque, NM, February 2–5,
SMITH, G.A.	UAH	2003.
LUZ, P.	SD46	
SUBSA and PFMI Transparent Furnace Systems Currently		STERLING, A.C.
in Use in the <i>International Space Station</i> Microgravity		United Applied Technologies
Science Glovebox—Abstract Only. For presentation at and		MOORE, R.L.
publication in Proceedings of the 41st AIAA Aerospace		SD50
Sciences Meeting and Exhibit, Reno NV, January 6–9,		Evidence for Gradual External Reconnection Before
2003.		Explosive Eruption of a Solar Filament—Abstract Only.
		For publication in The Astrophysical Journal, 2003.
STAHL, H.P.	SD70	STERLING, A.C.
Optics Needs for Future NASA Missions—Abstract Only.		United Applied Technologies
For presentation at and publication in Proceedings of		MOORE, R.L.
the SPIE Optical Science and Technology 48th Annual		SD50
Meeting, San Diego, CA, August 3–8, 2003.		Tether-Cutting Energetics of a Solar Quiet Region Prom-
		inence Eruption—Abstract Only. For publication in The
		Astrophysical Journal, 2003.
STATHAM, G.	ERC, Inc.	STOKES, J.W.
WHITE, S.	ERC, Inc.	FD22
ADAMS, R.B.	TD03	Enhancing the Human Factors Engineering Role in an
THIO, Y.C.F.	Dept. of Energy	Austere Fiscal Environment—Final Paper. For presentation
ALEXANDER, R.	TD03	at the 33rd International Conference on Environmental
FINCHER, S.	TD03	Systems, Vancouver, BC, Canada, July 7–10, 2003.
PHILIPS, A.	TD03	STORY, G.
POLSGROVE, T.	TD03	TD51
Engineering of the Magnetized Target Fusion Propulsion		ZOLADZ, T.F.
System—Final Paper. For presentation at the 39th AIAA/		TD51
ASME/SAE/ASEE Joint Propulsion Conference/Exhibit,		ARVES, J.
Huntsville, AL, July 20–23, 2003.		Lockheed Martin
		KEARNEY, D.
		Lockheed Martin
		ABEL, T.
		Lockheed Martin
		PARK, O.Y.
		Thiokol
		Hybrid Propulsion Demonstration Program 250K Hybrid
		Motor—Final Paper. For presentation at the 39th AIAA/
		ASME/SAE/ASEE Joint Propulsion Conference/Exhibit,
		Huntsville, AL, July 20–23, 2003.
STATHAM, G.	TD40	SUITS, M.W.
WHITE, S.	TD40	ED32
ADAMS, R.B.	TD40	LEAK, J.
THIO, Y.C.F.	Dept. of Energy	ED32
SANTARIUS, J.	University of Wisconsin	ED32
ALEXANDER, R.	TD40	BRYSON, C.
CHAPMAN, J.	TD40	Nondestructive Inspection Techniques for Friction
FINCHER, S.	TD40	Stir Weld Verification on the Space Shuttle External
PHILIPS, A.	TD40	Tank—Abstract Only. For presentation at the ASNT Fall
POLSGROVE, T.	TD40	Conference and Quality Testing Show, Pittsburgh, PA,
Engineering of the Magnetized Target Fusion Propulsion		October 13–16, 2003.
System—Final Paper. For presentation at the Space Tech-		SULLIVAN, D.G.
nology Applications International Forum, Albuquerque,		Auburn University
NM, February 2–5, 2003.		SHAW, J.N.
		Auburn University
		MASK, P.L.
		Auburn University
STEEVE, B.	ED22	RICKMAN, D.
VAN DYKE, M.V.	TD40	SD60
MAJUMDAR, A.K.	ED22	LUVALL, J.C.
NGUYEN, D.	ED22	SD60
CORLEY, M.	Stanford University	WERSINGER, J.M.
GUFFEE, R.M.	Los Alamos National Laboratory	Auburn University
KAPERINICK, R.J.	Los Alamos National Laboratory	Evaluating Corn (Zea Mays L) N Variability Via Remote
		Sensed Data—Abstract Only. For publication in the Com-
		munications in Soil Science and Plant Analysis, 2003.

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SULLIVAN, D.G.	Auburn University	TAKAHASHI, Y.	UAH
SHAW, J.N.	Auburn University	HILLMAN, L.W.	UAH
MASK, P.L.	Auburn University	ZUCCARO, A.	UAH
RICKMAN, D.	SD60	ADAMS, J.H.	SD50
LUVALL, J.C.	SD60	CLINE, D.	University of California
WERSINGER, J.M.	Auburn University	Detection of Upward Air Showers With the EUSO Experiments—Abstract Only. For presentation at the 28th International Cosmic Ray Conference, Tsukuba, Japan, July 31–August 7, 2003.	
Rapid Assessment of In Situ Wheat Straw Residue Via Remote Sensing Platforms—Abstract Only. For publication in Soil Science Society of America, 2003.			
SULLIVAN, D.G.	Auburn University	TAYLOR, J.	Austin Peay State
SHAW, J.N.	Auburn University	RAKOZY, J.	ED10
RICKMAN, D.	SD60	STEINCAMP, J.	ED10
MASK, P.L.	Auburn University	Genetic Algorithm Phase Retrieval for the Systematic Image-Based Optical Alignment Testbed—Preliminary Draft. For presentation at the Genetic and Evolutionary Computation Conference, Chicago, IL, July 12–16, 2003.	
WERSINGER, J.M.	Auburn University		
LUVALL, J.C.	SD60		
Using Remote Sensing Platforms to Estimate Near-Surface Soil Properties—Abstract Only. For publication in Remote Sensing of the Environment, 2003.			
SWARTZ, D.A.	USRA	TAYLOR, T.	Teledyne Brown Engineering
GHOSH, K.K.	USRA	MOTON, T.T.	Teledyne Brown Engineering
TENNANT, A.F.	SD50	ROBINSON, D.	Teledyne Brown Engineering
Properties of Ultra-Luminous X-ray Sources in the Chandra Archive of Galaxies—Abstract Only. For presentation at the 202nd American Astronomical Society Meeting, Nashville, TN, May 25–29, 2003.		ANDING, R.C.	Teledyne Brown Engineering
		MATLOFF, G.L.	Bangs/Matloff Aerospace
		GARBE, G.P.	TD05
		MONTGOMERY, E.E., IV	TD05
		Solar Sail Application to Comet Nucleus Sample Return—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
SWIFT, W.R.	ED44		
SUGGS, R.M.	ED44		
MEACHEM, T.	ED44	TENNANT, A.F.	SD50
COOKE, W.J.	ED44	SWARTZ, D.A.	USRA
Recent Advances in Video Meteor Photometry—Abstract Only. For presentation at the Leonid MAC Conference, Ames Research Center, CA, August 28–30, 2003.		GHOSH, K.K.	USRA
		WU, K.	University College London
		A Study of the X-Ray Source Population in the Dwarf Galaxy NGC 6822—Abstract Only. For presentation at the 202nd American Astronomical Society Meeting, Nashville, TN, May 25–29, 2003.	
SWINGLE, M.	University of South Alabama		
HONKANEN, R.	University of South Alabama		
CISZAK, E.	SD46	THOMAS, D.	VS01
Crystal Structure of the Catalytic Domain of a Serine Threonine Protein Phosphatase—Abstract Only. For presentation at the American Crystallographic Association Meeting, Covington, KY, July 26–31, 2003.		SMITH, C.	UP10
		SAFIE, F.M.	UP10
		KITTREDGE, S.	UP10
		Life Cycle Systems Engineering Approach to NASA's 2nd Generation Reusable Launch Vehicle—Extended Abstract. For presentation at the Workshop on Life Cycle Systems Engineering, Redstone Arsenal, AL, November 6–7, 2002.	
TAKAHASHI, K.	Johns Hopkins University		
DENTON, R.E.	Dartmouth College		
GALLAGHER, D.L.	SD50	THOMAS, D.	VS01
Toroidal Wave Frequency at L=6–10: AMPTE/CCE Observations and Comparison With Theoretical Model—Abstract Only. For publication in the Journal of Geophysical Research, 2003.		SMITH, C.	UP10

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THOMAS, L.	UP10	at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion	
KITTREDGE, S.	UP10	Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
Systems Engineering Approach to Technology Integration for NASA's 2nd Generation Reusable Launch Vehicle—Extended Abstract. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.			
THOMPSON, A.N.	SD60	TRINH, H.P. TD61	
SHAW, J.N.	SD60	EARLY, J. Los Alamos National Laboratory	
MASK, P.L.	SD60	OSBORNE, R. TD61	
TOUCHTON, J.T.	SD60	THOMAS, M.E. CFD Research Corporation	
RICKMAN, D.	SD60	BOSSARD, J.A. CFD Research Corporation	
Soil Sampling Techniques for Alabama Grain Fields—Abstract Only. For publication in Precision Agriculture, 2003.			
THOMPSON, M.S.	UAH	TRINH, H.P. TD61	
PAKHOMOV, A.V.	UAH	EARLY, J. Los Alamos National Laboratory	
HERREN, K.A.	SD71	OSBORNE, R. ERC, Inc.	
Effects of Two-Pulse Sequencing on Characteristics of Elementary Propellants for Ablative Laser Propulsion—Abstract Only. For presentation at the First International Symposium on Beamed Energy Propulsion, Huntsville, AL, November 5–7, 2002.			
TREVINO, L.C.	ED14	THOMAS, M.E. CFD Research Corporation	
OLCMEN, S.	UAH	BOSSARD, J.A. CFD Research Corporation	
POLITES, M.	UAH	Technology Development of a Fiber Optic-Coupled Laser Ignition System for Multicombustor Rocket Engines—Final Paper. For presentation at the Propulsion Engineering Research Center 14th Annual Symposium on Propulsion, University Park, PA, December 10–11, 2002.	
Use of Soft Computing Technologies for Rocket Engine Control—Abstract Only. For presentation at the 22nd Digital Avionics Systems Conference, Indianapolis, IN, October 12–16, 2003.			
TRINH, H.P.	TD61	TRINH, H.P. TD61	
BULLARD, B.	TD61	KOPICZ, C. ERC, Inc.	
KOPICZ, C.	TD61	BULLARD, B. TD61	
MICHAELS, S.	U.S. Army Missile Command	MICHAELS, S. U.S. Army Missile Command	
Investigation of Impinging Stream Vortex Chamber Concepts for Liquid Rocket Engine Applications—Abstract Only. For presentation at the JANNAF/CS/APS/PSHS/MSS Joint Meeting, Colorado Springs, CO, December 1–5, 2003.			
TRINH, H.P.	TD61	Evaluation of Impinging Stream Vortex Chamber Concepts for Liquid Rocket Engine Applications—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
EARLY, J.	Los Alamos National Laboratory	TROLINGER, J.D. MetroLaser	
OSBORNE, R.	ERC, Inc.	L'ESPERANCE, D. MetroLaser	
Evaluation and Characterization Study of Dual Pulse Laser-Induced Spark (DPLIS) for Rocket Engine Ignition System Application—Abstract Only. For presentation			
		RANGEL, R. University of California	
		COIMBRA, C. University of Hawaii	
		WITHEROW, W.K. SD46	
		Design and Preparation of a Particle Dynamics Space Flight Experiment, Shiva—Abstract Only. For presentation at and publication in Proceedings of the Microgravity Transport Processes in Fluid, Thermal, Biological, and Materials Sciences III Conference, Davos, Switzerland, September 14–19, 2003.	
		TUCKER, D.S. SD71	
		Proof Test Diagrams for a Lithia-Alumina-Silica Glass-Ceramic—Final Paper. For publication in the Journal of Materials Science Letters, 2003.	

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(Publicly available. Dates are conference dates.)

TUCKER, J.	Southern Research Institute	Exhibition, Long Beach, CA, May 11–15, 2003, and at the
DASPIT, G.	Southern Research Institute	Rapid Prototyping and Manufacturing Institute, Atlanta,
STALLCUP, M.	SD71	GA, October 8–10, 2002.
PRESSON, J.	SD71	
NEIN, M.	UAH	VAIDYANATHAN, R. University of Florida
High Accuracy Thermal Expansion Measurement at		TD64
Cryogenic Temperatures—Abstract Only. For presentation		
at and publication in Proceedings of the SPIE Optical		PAPILA, N. University of Florida
Science and Technology 48th Annual Meeting, San Diego,		SHYY, W. University of Florida
CA, August 3–8, 2003.		CFD-Based Design Optimization for Single-Element
		Rocket Injector—Final Paper. For presentation at the 41st
		AIAA Aerospace Sciences Meeting and Exhibit, Reno,
		NV, January 6–9, 2003.
TUCKER, D.S.	SD70	
ETHRIDGE, E.C.	SD70	
SMITH, G.A.	UAH	VAISBERG, O.L. SD50
WORKMAN, G.	UAH	AVANOV, L.A. SD50
Effects of Gravity on ZBLAN Glass Crystallization—		MOORE, T.E. SD50
Abstract Only. For presentation at and publication in		Ion Velocity Distributions Within LLBL and Their Possible
Proceedings of the Microgravity Transport Processes in		Implication to Multiple Reconnections—Abstract Only.
Fluid, Thermal, Biological and Materials Sciences III		For publication in Annales Geophysicae, 2003.
Conference, Davos, Switzerland, September 14–19, 2003.		
		VAISBERG, O.L. SD50
TUCKER, D.S.	SD71	AVANOV, L.A. SD50
NETTLES, A.T.	SD71	SMIRNOV, V.N. SD50
CAGLE, H.	SD71	MOORE, T.E. SD50
Lifetime Predictions of a Titanium Silicate Glass With		Observations of Counter-Streaming Ion Velocity Dis-
Machined Flaws—Abstract Only. For publication in the		tributions in LLBL—Abstract Only. For publication in Geo-
Journal of Materials Science Letters, 2003.		physical Research Letters, 2003.
TURNER, S.G.	UP40	VAISBERG, O.L. SD50
Flight Demonstrations of Orbital Space Plane (OSP)		SMIRNOV, V.N. SD50
Technologies—Final Paper. For presentation at the AIAA/		AVANOV, L.A. SD50
ICAS International Air and Space Symposium, Dayton,		MOORE, T.E. SD50
OH, July 14–17, 2003.		Evidence for Spiral Magnetic Structures at the Mag-
		netopause: A Case for Multiple Reconnections—Abstract
		Only. For publication in Advances in Space Research,
		2003.
TURNER, S.G.	UP40	
Orbital Space Plane Program Flight Demonstrators		VAN DER WOERD, M.J. SD46
Status—Abstract Only. For presentation at the 54th		Protein Crystal Growth With the Aid of Microfluidics—
International Astronautical Congress, Bremen, Germany,		Abstract Only. For presentation at the Materials and Crystal
September 29–October 3, 2003.		Growth Seminar, MSFC, AL, December 16, 2002.
VAIDYANATHAN, R.	Adv. Ceramics Research	
GREEN, C.	Adv. Ceramics Research	VAN DER WOERD, M.J. SD46
PHILLIPS, T.	Adv. Ceramics Research	FERREE, D.S. SD46
CIPRIANI, R.	Adv. Ceramics Research	SNELL, E.H. SD46
YARLAGADDA, S.	University of Delaware	Perfectly Cold Crystals: What Happens When They are
GILLESPIE, J.	University of Delaware	X-Rayed?—Abstract Only. For presentation at the Ameri-
EFFINGER, M.	ED34	can Crystallographic Association Meeting, Covington,
COOPER, K.C.	ED34	KY, July 26–31, 2003.
Rapid Prototyping of Continuous Fiber-Reinforced Ceramic		
Matrix Composites—Final Paper. For presentation For		
presentation at the SAMPE International Symposium &		

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(Publicly available. Dates are conference dates.)

VAN DYKE, M.V.	TD40	of the SPIE Optical Science and Technology 48th Annual Meeting, San Diego, CA, August 3–8, 2003.	
HOUTS, M.	TD40		
GODFROY, T.J.	TD40		
DICKENS, R.	TD40	VITARIUS, P.	UAH
MARTIN, J.J.	TD40	GREGORY, D.A.	UAH
SALVAIL, P.	TD40	WILEY, J.	TD72
CARTER, R.R.	TD40	KORMAN, V.	Madison Research Corp.
Test Facilities in Support of High Power Electric Propulsion Systems—Final Paper. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.		Acoustic Wave Propagation in Pressure Sense Lines—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.	
VAN DYKE, M.V.	TD40	VOLZ, M.P.	SD46
HOUTS, M.	TD40	PALOSZ, W.	BAE/SD46
GODFROY, T.J.	TD40	SZOFRAN, F.R.	SD46
MARTIN, J.J.	TD40	In Situ Pressure Measurements During the Detached Growth of Germanium—Abstract Only. For presentation at the Microgravity Transport Processes in Fluid, Thermal, Biological, and Materials Sciences Conference III, Davos, Switzerland, September 14–19, 2003, and for presentation at the International Conference on Single Crystal Growth and Heat and Mass Transfer, Obninsk, Russia, September 22–26, 2003.	
Early Flight Fission Test Facilities (EFF-TD) and Concepts That Support Near-Term Space Fission Missions—Final Paper. For presentation at and publication in Proceedings of the International Congress on Advances in Nuclear Power Plants, Cordoba, Spain, May 4–7, 2003.			
VAUGHN, J.A.	ED31		
WELZYN, K.J.	TD54		
CURTIS, L.	TD04	WALKER, J.L.	ED32
Plasma Interactions With a Negative Biased Electrodynamic Tether—Abstract Only. For presentation at the 8th Spacecraft Charging Technology Conference, Huntsville, AL, October 20–24, 2003.		RUSSELL, S.S.	ED32
		SUITS, M.W.	ED32
		Microcrack Quantification in Composite Materials by a Neural Network Analysis of Ultrasound Spectral Data—Abstract Only. For presentation at the ASNT Fall Conference and Quality Testing Show, Pittsburgh, PA, October 13–17, 2003.	
VICKERS, J.	ED34		
NASA's National Center for Advanced Manufacturing—Abstract Only. For presentation at the SAE Aerospace Manufacturing Technology Conference, Montreal, PQ, Canada, September 8–12, 2003.		WALKER, J.S.	University of Illinois
		VOLZ, M.P.	SD46
		MAZURUK, K.	SD46
VIKRAM, C.S.	UAH	Rayleigh-Benard Instability in a Vertical Cylinder With a Rotating Magnetic Field—Abstract Only. For publication in the International Journal of Heat and Mass Transfer, 2003.	
WITHEROW, W.K.	SD46		
Two-Color Interferometry With Nonlinear Refractive Properties—Abstract Only. For publication in the Optik Journal, 2003.			
VIRANI, S.	SD50	WANG, T.-S.	TD64
SCHWARTZ, D.	SD50	DROEGE, A.	TD64
CAMERON, R.A.	SD50	D'AGOSTINO, M.	TD64
PLUCINSKY, P.	SD50	LEE, Y.-C.	TD64
O'DELL, S.L.	SD50	WILLIAMS, R.W.	TD64
MINOW, J.I.	SD50	Base-Bleed Effect on X-33 Aerospike Plume Induced Base-Heating Environment During Power-Pack Out—Final Paper. For presentation at the 36th AIAA Thermophysics Conference, Orlando, FL, June 23–26, 2003.	
BLACKWELL, W.C.	SD50		
Improving the Science Observing Efficiency of the Chandra X-Ray Observatory Via the Chandra Radiation—Abstract Only. For presentation at and publication in Proceedings			

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WEFEL, J.P.	Louisiana State University	Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002.	
ADAMS, J.H.	SD50		
AHN, H.S.	University of Maryland		
BASHINDZHAGYAN, G.L.	Moscow State University	WEISSKOPF, M.C.	SD50
BATKOV, K.E.	Moscow State University	BECKER, W.E.	SD50
CHANG, J.	Max Planck Institute	SWARTZ, D.A.	SD50
CHRISTL, M.J.	SD50	PAVLOV, G.G.	SD50
COX, M.	SD50	ELSNER, R.F.	SD50
ELLISON, S.B.	Louisiana State University	GRINDLAY, J.	SD50
FAZLEY, A.R.	Southern University	MIGNANI, R.	SD50
The ATIC Science Flight in 2002–2003: Description and Preliminary Results—Abstract Only. For presentation at the 28th International Cosmic Ray Conference, Tsukuba, Japan, July 31–August 7, 2003.		TENNANT, A.F.	SD50
		BACKER, D.	SD50
		PULONE, L.	SD50
		Chandra Observations of M28—Abstract Only. For presentation at The Restless High-Energy Universe, Amsterdam, The Netherlands, May 5–8, 2003.	
WEIR, J.M.	ED19		
WELLS, B.E.	ED19	WEISSKOPF, M.C.	SD50
An Agent-Inspired Reconfigurable Computing Implementation of a Genetic Algorithm—Final Paper. For presentation at the International Conference on Parallel and Distributed Processing Techniques and Applications, Las Vegas, NV, June 23–26, 2003.		O'DELL, S.L.	SD50
		PAERELS, F.	Columbia University
		ELSNER, R.F.	SD50
		BECKER, W.E.	Max Planck Institute
		TENNANT, A.F.	SD50
WEISSKOPF, M.C.	SD50	SWARTZ, D.A.	SD50
Chandra (Book Article)—Final Paper. For publication in the Encyclopedia of Science & Technology, John Wiley & Sons, Inc., Hans Mark (ed.), 2002.		Chandra Phase-Resolved X-Ray Spectroscopy of the Crab Pulsar—Abstract/Introduction Only. For publication in The Astrophysical Journal, 2003.	
WEISSKOPF, M.C.	SD50	WEISSKOPF, M.C.	SD50
Chandra Observations of Supernova Remnants and Neutron Stars—An Overview—Abstract Only. For presentation at and publication in Proceedings of the 34th Joint Committee on Space Research (COSPAR) Scientific Assembly & 2nd World Space Congress, Houston, TX, October 10–19, 2002.		WU, K.	University College London
		TENNANT, A.F.	SD50
		SWARTZ, D.A.	USRA
		On the Nature of the Eclipsing Bright X-Ray Source in the Circinus Galaxy Field—Abstract Only. For presentation at the HEAD 2003—Seventh Meeting of the AAS High-Energy Astrophysics Division, Mt. Tremblant, PQ, Canada, March 23–26, 2003.	
WEISSKOPF, M.C.	SD50		
Four Years of Operation of the Chandra X-Ray Observatory—Abstract Only. For presentation at and publication in Proceedings on SPIE 48th Annual Meeting, San Diego, CA, August 3–8, 2003.		WELCH, A.C.	AD42
		International Space Station Laboratory “Destiny” Hardware Move From MSFC to KSC—Final Paper. For presentation at the Society of Logistics Engineers 38th Annual International Conference and Exhibition, Huntsville, AL, August 10–14, 2003.	
WEISSKOPF, M.C.	SD50		
The Development of the Chandra X-Ray Observatory—Abstract Only. For presentation at the Chandra Fellows Symposium, Cambridge, MA, October 6–12, 2003.		WELCH, C.L.	FD30
		ISS Space-Based Science Operations Grid for the Ground Systems Architecture Workshop—Viewgraphs Only. For presentation at the Ground System Architectures Workshop, Manhattan Beach, CA, March 4–6, 2003.	
WEISSKOPF, M.C.	SD50		
Three Years of Operation of the Chandra X-Ray Observatory—Abstract Only. For presentation at and publication in the proceedings of SPIE Astronomical			

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WELCH, C.L.	FD42	WIELAND, P.	FD21
Tutorial: Setting up a Grid—A Guide for Beginners by a Beginner—Abstract Only. For presentation at the Globus World 2004, San Francisco, CA, January 20–23, 2004.		HOLT, M.	FD21
		ROMAN, M.	FD21
		COLE, H.E.	Boeing
		DAUGHERTY, S.	Boeing
WERT, M.J.	SD46	<i>International Space Station</i> Internal Thermal Control	
HOFMEISTER, W.H.	SD46	System Cold Plate/Fluid-Stability Test—Two Year	
BAYUZICK, R.J.	SD46	Update—Final Paper. For presentation at the 33rd	
ROGERS, J.R.	SD46	International Conference on Environmental Systems,	
RATHZ, T.J.	SD46	Vancouver, BC, Canada, July 7–10, 2003.	
FOUNTAIN, G.	SD46		
HYERS, R.W.	SD46	WIELAND, P.	FD21
Determination of Nucleation Kinetic Parameters of Metallic Melts Using Electrostatic Levitation Techniques—Abstract Only. For presentation at the 15th International Symposium on Experimental Methods for Microgravity Materials Science, San Diego, CA, March 6–9, 2003.		MILLER, L.	Sverdrup
		IBARRA, T.	Boeing
		<i>International Space Station</i> Internal Thermal Control	
		System Lab Module Simulator Buildup and Validation—	
		Abstract Only. For presentation at the 33rd International	
		Conference on Environmental Systems, Vancouver, BC,	
		Canada, July 7–10, 2003.	
WEST, J.S.	TD64	WILSON, C.A.	SD50
ROTHERMEL, J.	TD64	9.1 Years of All-Sky Hard X-Ray Monitoring With	
Application of the Loci-Based CFD Code Chem at MSFC: Preliminary Results—Presentation. For presentation at the MSFC Fall Workshop on Fluids, Huntsville, AL, November 19–21, 2002.		BATSE—Abstract Only. For presentation at the Workshop	
		on X-Ray Binaries in the Chandra and XMM-Newton Era,	
		Cambridge, MA, November 14–15, 2002.	
WEST, J.S.	TD64	WILSON, C.A.	SD50
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Combustion Devices CFD Simulation Capability Roadmap—Charts. For presentation at the MSFC Spring Workshop on Fluids, Birmingham, AL, April 22–24, 2003.		JONKER, P.G.	Cambridge University
		VAN DER KLIS, M.	University of Amsterdam
		LEWIN, W.H.G.	MIT
		BELLONI, T.	Osservatorio (Italy)
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CURRERI, P.A.	SD46	X-Ray Binaries—Abstract Only. For publication in The	
SMITH, T.R.	SD46	Astrophysical Journal, 2003.	
Space Station Science Supported by Marshall Space Flight Center—Abstract Only. For presentation at the AIAA Seminar Session IV, Huntsville, AL, March 15, 2003.		WILSON, C.A.	SD50
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Cycle Trades for Nuclear Thermal Rocket Propulsion Systems—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		Chandra Observations of Faint LMXBs—Abstract Only.	
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Robust Control for Microgravity Vibration Isolation Using Fixed-Order, Mixed H ₂ /U/Design—Final Paper. For presentation at the AIAA Guidance, Navigation, and Control Conference, Austin, TX, August 11–14, 2003.		Turbine Air-Flow Test Rig CFD Results for Test Matrix—	
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WINGARD, C.D.	ED34	Composition Dependence of the Hydrostatic Pressure Coefficients of the Bandgap of ZnSe1-xTE x Alloys—Abstract Only. For publication in Physical Review B, 2003.
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Marshall Space Flight Center and the Reactor-in-Flight Stage: A Look Back at Using Nuclear Propulsion to Power Space Vehicles in the 1960's—Final Paper. For presentation at the 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference/Exhibit, Huntsville, AL, July 20–23, 2003.		Mechanical Design of a Performance Test Rig for the Turbine Air-Flow Task (TAFT)—Abstract Only. For presentation at the 52nd JANNAF Propulsion Meeting/1st Liquid Propulsion Subcommittee Meeting, Las Vegas, NV, May 10–13, 2004.
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